

**Report on Statewide Small Generator Interconnection Standards
to the Utilities and Energy Committee
by the Maine Public Utilities Commission**

January 15, 2009

I. INTRODUCTION

During the 2008 session, the Legislature enacted Resolve, To Encourage Renewable Energy and Energy Conservation in Maine.¹ Section 2 of the Resolve directs the Commission to conduct a review of the advisability of statewide interconnection standards for small renewable generation facilities. The Resolve states in relevant part:

That the Public Utilities Commission shall review and make a determination regarding the establishment of statewide standards for the interconnection of small renewable energy facilities to the energy grid. For the purposes of this section, "small" means an installed capacity of no more than 5 megawatts. In making its determination, the commission shall consider relevant federal laws and rules as well as interconnection standards that have been developed by states and other appropriate entities. If the commission finds that statewide interconnection standards for small renewable energy facilities are advisable, the commission shall proceed to develop such standards. In any development of interconnection standards pursuant to this section, the commission may establish different standards for different tiers of facilities based on generating capacity and may develop any necessary interconnection agreements and related forms, as appropriate.

The Resolve specifies that the Commission shall submit a report by January 15, 2009 containing its findings and recommendations regarding the advisability of creating statewide small generator interconnection standards.

To obtain information and viewpoints from interested persons on small generator interconnection standards, the Commission initiated an Inquiry.² In the Notice of Inquiry, the Commission asked transmission and distribution (T&D) utilities to provide their small generator interconnections standards and rules, and solicited input on a variety of issues regarding uniform interconnection standards. On April 23, 2008 the

¹ Resolves 2007, ch. 183.

² *Inquiry into Interconnection Standards for Small Renewable Energy Facilities*, Docket No. 2008-186 (April 23, 2008).

Commission released a draft report on statewide small generator interconnection standards for comment by interested persons.³

The following interested persons participated in the Commission's small generator interconnection standards Inquiry: Central Maine Power Company (CMP), Bangor Hydro-Electric Company (BHE), Maine Public Service Company (MPS), Van Buren Light and Power District (VBLPD), Kennebunk Light and Power District (KLPD), American Wind Power Association (AWEA), Independent energy Producers of Maine (IEPM), Maine Rural Partners (MRP), the Interstate Renewable Energy Council, the E Cubed Company, Suzanne Sayer, and John Carpenter.

II. SMALL GENERATOR INTERCONNECTION OVERVIEW

A. Background

Over the past few years, several states and the federal government have worked to create jurisdiction-wide standards for small generator interconnection.⁴ This follows an expansion in state net metering rules⁵ that occurred in the mid-1990s, and an increased interest in distributed generation systems among consumers. The increased interest in distributed generation is due to a variety of factors. These include potential benefits of reducing stress on aging grid infrastructure, reduced greenhouse gas emissions, and increasing energy security and efficiency. Determining how to facilitate the increased use of smaller distributed generators however, requires careful consideration of promotional mechanisms, pricing, technical, and legal and procedural issues.

Small generator promotional issues involving renewable resources relate largely to the net metering rules. Maine has had net metering in place since the early 1980s,⁶ and at the direction of the Legislature the Commission has prepared a report

³ All comments filed in the Inquiry are posted on the Commission's virtual case file on its webpage, www.maine.gov/mpuc, through reference to Docket No. 2008-186.

⁴ Although the Resolve focuses on renewable resources, there appears to be no reason to distinguish among types of small generation resources with respect to small generator interconnection standards. Accordingly, this report does not distinguish among types of resources in its consideration of small generator interconnection standards.

⁵ Net metering is a billing and metering practice in which a customer is billed based on the difference between the kilowatt-hours the customer consumes and the kilowatt-hours produced by the customer's generating facility.

⁶ Chapter 313 of the Commission's rules.

and provisional rules regarding potential changes to the net energy billing rules.⁷ The existing rules and utility term and conditions cover many of the issues surrounding small generation systems, including fees and procedures for interconnections, and the amount insurance that utilities can require for interconnected systems.

Technical issues are related to safety, power quality, and impacts to the transmission and distribution system. National standards have been developed that address these issues for many systems. These standards are Institute of Electrical and Electronic Engineers (IEEE) 1547 and Underwriters Laboratories (UL) 1741. The intent of these standards is to ensure that certified systems are safe for interconnection.

Legal and procedural issues relate largely to the problem of disparate rules from state to state or even utility to utility. The less disparate the procedures and rules are from one region to the next the easier it is for system sellers and installers to develop standard practices. Standard practices serve to increase efficiency and reduce the costs of systems to the purchasers.

In the past few years, several entities have worked to create uniform model procedures and agreements for small generator interconnection. The three major uniform rules are the Federal Energy Regulatory Commission's (FERC) Small Generator Interconnection Procedure (SGIP), Interstate Renewable Energy Council's (IREC) model standards, and Mid-Atlantic Demand Resources Institute's (MADRI) model standards. The FERC's SGIP has been the most widely used.⁸ The IREC model is in large part based on the FERC model, but a few changes were made to improve timeframes, and to lower remaining barriers to small generation.⁹ MADRI is less utilized by other states. It was originally developed for the Mid-Atlantic States, and has at least informed Pennsylvania's small generator interconnection process, but few others. Several states have been influenced by both the IREC and the SGIP rules in drafting their own interconnection rules and this report does not provide an exhaustive listing of all rules in other states.

Also over the past few years, two of the nationally recognized electrical testing laboratories, the IEEE and UL developed standards specifically to ensure that distributed generation systems that they certify are safe for interconnection. Those standards are IEEE 1547, and UL 1741.¹⁰ Each sets minimum safety requirements for

⁷ Resolves 2007, ch. 183.

⁸ See IREC, *Connecting to the Grid*, at p. 7-8 (2007), available at http://www.irecusa.org/fileadmin/user_upload/ConnectDocs/IC_Guide.pdf (last visited Nov. 10, 2008).

⁹ See *Id.* at 32.

¹⁰ See UL 1741, Available at <http://www.comm-2000.com/productdetails.aspx?sendingPageType=BigBrowser&CatalogID=Standards&>

equipment that will be used to interconnect to the grid including inverters, converters, controllers, and other equipment. All of the major model interconnection procedures recognize that systems complying with these standards require less robust review because they have already been extensively tested. Not all recognize that certified inverter based systems do not require an external disconnect switch to prevent accidental energizing of dead lines.

FERC has jurisdiction over generator interconnection on transmission lines, but except for limited situations, FERC does not have jurisdiction over distribution systems.¹¹ The exception is that FERC may claim jurisdiction over a distribution line when a “non-qualifying facility” generator interconnects to a distribution line covered by a public utility’s Open Access Transmission Tariff to make wholesale sales of electricity.¹² Thus, for most instances in Maine has jurisdiction to adopt uniform interconnection standards for small generator interconnection to the utilities’ distribution system, which is the likely point of interconnection for the majority of the small generation units.

B. Current Maine Small Generator Interconnection

In Maine, each utility uses different procedures and each has its own requirements for the interconnection of small generators to their distribution systems. Below are summaries of these procedures.

Central Maine Power Company

CMP uses FERC’s SGIP to govern its small generator interconnection process. This procedure varies based on the size of the facility. There is a very abbreviated process for inverter based generation that is no greater than 10kW, a fast track process for generators that are less than 2MW, and a more involved process for those generators larger than 2MW but less than 20MW.

[ProductID=UL1741_1_S_19990507\(ULStandards2\)](#) (last visited Nov. 6, 2008), and see IEEE 1547-2003 (Reaff. 2008) available at [https://sbwsweb.ieee.org/ecustomer/cme_enu/start.swe?SWECmd=GotoView&SWEView=Catalog+View+\(eSales\)_Standards_IEEE&mem_type=Customer&SWEHo=sbwsweb.ieee.org&SWETS=1192713657](https://sbwsweb.ieee.org/ecustomer/cme_enu/start.swe?SWECmd=GotoView&SWEView=Catalog+View+(eSales)_Standards_IEEE&mem_type=Customer&SWEHo=sbwsweb.ieee.org&SWETS=1192713657) (last visited Nov. 6, 2008).

¹¹ FERC Order 2006 requires all public utilities that own, control, or operate facilities under the FERC’s jurisdiction to file standard procedures, the SGIP, and a standard agreement with respect to interconnection of generating facilities up to 20 MW. FERC Order 2006, 18 CFR Part 35 at p. 4-5.

¹² *Id.*

CMP has several employees dedicated to handling small generator interconnection requests from customers, which ensures that the customer will be dealing with a person who is knowledgeable regarding the process. CMP requires customers to install a company accessible double throw disconnect switch at their own expense prior to interconnection of backup generation, and in the case of customers with generation operating in parallel with CMP's system a visible break switch may be required.¹³ In practice CMP does not require visible disconnect switches for inverter based systems that comply with UL 1741 and/or IEEE 1547 standards.

Bangor Hydro-Electric Company

BHE employs a very different procedure than CMP to interconnect small generators. Rather than using the SGIP adopted by ISO-NE and FERC, BHE uses its own process and agreement. BHE follows three different interconnection procedures depending on the size of the generator. For those facilities under 10kW, the most simplified process and application are used. For facilities between 10kW and 100 kW, a more involved process and application are required. For any generator larger than 100kW, a process more like that for traditional centralized generation is used. The greater than 100 kW process involves more case specific analysis, closer consultation with BHE staff, and consequently higher fees and timeframes.

From BHE's Inquiry comments, it is not clear whether it has staff dedicated to customer requests to interconnect their generators. BHE like CMP gives itself the discretion to require a disconnect switch at the customer's expense.

Maine Public Service Company

MPS uses the SGIP process for small generator interconnection with some additional requirements specific to MPS. The first MPS specific requirement is its "Standard Requirement for MPS" dated January 2000. This requires that interconnection of generating equipment not adversely affect MPS customers, equipment or personnel, in addition it provides that all equipment be inspected by MPS and given written approval prior to operation. A second MPS specific requirement is completion of the "Information Required for Analyzing Commercial & Industrial Customer Load Requirement."¹⁴ The form itself is simple, but it replicates much information that would already be provided in FERC's SGIP. The third requirement also replicates a step that is required under SGIP, a one-line electrical diagram of the

¹³ *Id.* at Att. 4, 25-6.065 (6) (A "double throw switch" is a device that separates a small generation customer's load and generation from the utility's distribution system. Under CMP's requirement these switches have to allow the utility to see that the switch has effectively achieved disconnection).

¹⁴ *Id.* at Att. 2.

generator and its interconnection. Under the SGIP, MPS would also have discretion over whether a disconnect switch is necessary for small inverter based systems.

III. INQUIRY COMMENTS

Summaries of the comments received in response to the Inquiry are included below. The majority of the comments support imposing statewide standards for small generator interconnection. CMP and MPS are not in support of such standards, preferring instead to rely on the procedure contained in the FERC SGIP, with company specific additional requirements.

CMP and MPS do not support the creation of statewide interconnection standards for small generators noting that the FERC already has interconnection procedures in place that have been adopted by ISO-New England (ISO-NE). The position of these utilities is that the FERC procedures coupled with Maine's current rules regarding net energy billing (Ch. 313) and small generation aggregation (Ch. 315) are sufficient to provide a straightforward process for small generator interconnection, and that a statewide standard would create confusion and conflict with otherwise applicable FERC and ISO-NE interconnection procedures.

MPS comments further that the Northern Maine Independent System Administrator may have to change its Market Rule # 8 to accommodate small generators.¹⁵ MPS fails to address in its comments whether or which small generators interconnect to the Northern Maine Transmission System (NMTS) versus the Maine Public Service distribution system. NMISA's Market Rule #8 applies only to those facilities interconnecting with the NMTS.¹⁶ The NMISA definition of NMTS is the total of all transmission facilities located in Northern Maine and operated in accordance with FERC's Order No. 888, and FERC's subsequent orders and decisions with respect interconnection.

BHE and KLPD support statewide interconnection standards for small generators due to benefits to the efficiency, simplicity, consistency that could be achieved. KLPD commented that any standards should have a disconnect switch provision, and recognize the various safety needs of the different utilities.

VBLPD does not have any small generators interconnected to its system, and has not developed any standards for interconnecting them. VBLPD does not object to the imposition of any standards through this proceeding and plans to adopt whatever standards might be developed through it

¹⁵ See NMISA 6 Second Revised FERC Rate Schedule No. 2 at p. 57 (Sep. 1, 2007) (available at http://www.nmisa.com/docs/nmmr_sept_2007.pdf).

¹⁶ *Id.* at p. 57 § 8.1.1.

The non-utility commenters all support the imposition of statewide small generator interconnection standards as a means to facilitate the installation of small renewable facilities. These commenters generally cite the benefits of renewable power such as economic development, clean air, lower electricity prices, reduced dependence on foreign energy sources, and increased energy security and reliability.

AWEA, IEPM and MRP state that the market for small renewable distributed generation technologies requires standardized, fair and streamlined procedures in order to be successful, noting complexity, length of time to completion, and costly processes as a reason that consumers abandon efforts to install small wind systems. AWEA comments that thirty five states have standard interconnection procedures for small generation. AWEA and IEPM recommend a tiered approach to small generation interconnection based on the size of the generator rather than based on the type of generator, in which smaller facilities would have simplified and more streamlined interconnection requirements.

Ms. Sayer strongly supports the imposition of statewide interconnection standards, largely due to the benefits of such technology and Mr. Carpenter commented that systems that met the interconnection requirements at the time of installation should not need to meet additional requirements so that current small generation owners are not burdened.

III. DISCUSSION OF POLICY CONSIDERATIONS

Maine's net metering rules significantly advance the goal of promoting smaller consumer owned forms of renewable power. The adoption of statewide standards for the interconnection of these resources would compliment the State's net metering rules, and further facilitate small renewable projects at the consumer level by making it easier and cheaper to connect their systems to the power grid. Beyond facilitation of small renewable projects standardized rules would also work to the advantage of non-renewable forms of small generation. Though these generators do not utilize renewable fuel sources, they can have efficiency benefits that are consistent with Maine's policy goals.

One of the key benefits of a standardized process is that it is easier, on several levels, for manufacturers and installers of these systems. Transaction costs are reduced to the extent that the process is the same, or nearly the same, between utilities and from state to state. Furthermore, under a standardized procedure small generation systems can be better designed to ensure compliance with IEEE 1547 and UL1741 instead of having to customize their products to meet each different utility's requirements. This is likely to reduce the cost of the generation equipment and its installation. A standardized procedure can also serve to reduce the expense to utilities in managing the interconnection requests from its customers, especially to the extent that it reduces the time its employees need to spend on each interconnection request.

Some of the utilities in Maine, through adoption of the SGIP, have already taken a step towards a more uniform and standardized process that is familiar to many system manufacturers and installers. There remains, however, some utility specific requirements that diminish the benefit of this to some extent. There also remain several utilities in the State that fully rely on processes designed by them and specific to interconnections in their territory. Adoption of a statewide standard will eliminate utility specific requirements, and different procedures from one utility to the next. Adoption would also allow system manufacturers and installers to standardize their operations.

There is value to system manufacturers and installers in knowing that they will go through the same process to interconnect anywhere in Maine. A statewide process should allow manufacturers and installers to reach more customers, and should result in more customer choice with respect to equipment and the professionals who will install it.

A potentially contentious point that AWEA raised explicitly in its comments and that IEPM implicitly raised in its comments is the requirement of an external disconnect switch. These switches are primarily intended to enable the utility to ensure that generation equipment does not unintentionally energize dead lines. This is a serious issue, because “islanding” as it is called has the potential to cause injury or death to utility workers or members of the public who come into contact with a downed line. At the same time, it is an important issue for consumers, because the expense of adding an external disconnect switch increases the cost of the project.

For certain systems, often referred to as “inverter based,” standards have been developed to make sure that anti-islanding functions are incorporated into the generator’s design. IEEE 1547 and UL 1741 both apply to these types of systems, and as nationally recognized testing laboratories their certification that these devices function the way they were designed should carry some weight.¹⁷ Nevertheless, utilities routinely require disconnect switches even for certified inverter based generators. Given the certifications, this approach appears to go beyond what is necessary to ensure reliability and safety. The policy question here is whether such a conservative approach by the utilities is in keeping with the State’s goal of promoting renewable power. The question is whether the added safety benefit is worth the potential that the additional expense of the switch will discourage people who would have otherwise installed a small generator.

Currently the disconnect switches cost from 1.5% to 10% (\$200-\$400) of a typical inverter-based small generation system (\$4000-\$8000).¹⁸ The cost of the systems is expected to decline as the technology matures. The cost of the disconnect

¹⁷ *Connecting to the Grid*, at p. 16.

¹⁸ See Christopher Cook, *Interconnected PV- The Utility Accessible Disconnect Switch*, at pp. 4-5, available at <http://www.e3energy.com/Extdisc.doc> (last visited Nov. 17, 2008); (CMP notes that the disconnect switches it requires for certain generation connected in parallel to its system costs \$125 installed rather than the amount cited)

switches is expected to remain stable as it is already a mature technology.¹⁹ This means that the cost of the switches relative to the cost of the generation systems will increase over time making the cost of disconnect switches even more likely to discourage further adoption of small generation.

This report focuses on the SGIP and IREC models as potential uniform standards in Maine. The focus is due in large part to the fact that two of Maine's utilities already use the SGIP. The IREC model is very similar to the SGIP, but it arguably goes further towards reducing the time and expense of interconnecting for small generators. Adopting either in whole or modified form will require less time and expense for CMP and MPS to incorporate given that they are already familiar with most of these procedures. The SGIP has also been used in many other states as a basis for their standards, and employing a standard with similar provisions has the potential to bring greater industry standardization. The IREC model aside from being based on the SGIP was an attempt to further reduce barriers to interconnecting small generators, which is consistent with the Legislature's direction that standardized interconnection standards and procedures for generators be examined.

V. MODEL AGREEMENTS

This section discusses the differences between the SGIP and IREC's model procedures.

A. FERC's SGIP

The SGIP, like all of the model small generator interconnection procedures, looks at several tiers of generators based primarily on their size or desired interconnection points. The first tier of review is for 10kW or smaller inverter based facilities that either (i) passes certain screens in the procedure or (ii) are determined safe to operate by an interconnecting utility after it has reviewed the design for or tested a facility. For interconnection requests submitted under this tier, the non-refundable processing fee is \$100.

The next tier, a "Fast Track Process," is available for facilities no larger than 2 MW that meet UL 1741 or IEEE 1547, or that are determined safe to operate, but for this level there is no inverter requirement. For the first and second tiers, systems are qualified by using a series of technical screens.²⁰ If the Interconnection Request is submitted under the Fast Track Process, the non-refundable processing fee is \$500.

¹⁹ See *Id.*

²⁰ SGIP §. 2.1 and Attachments 5

The final tier, a four-step “Study Process,” is available for facilities up to 20 MW that do not qualify for the other two. The Study Process includes a scoping meeting, feasibility study, system impact study, and facilities study.²¹

Under the 10 kW Inverter Process and the Fast Track Process,²² a utility has 3 business days after receiving an interconnection request to notify the customer they received the request and 10 business days to notify the customer whether the request is complete. Within 15 business days of notifying the customer that the request is complete, the utility must perform a review based on the screening criteria in the SGIP, and then notify the customer of the results. Within 5 business days thereafter, if a proposed generation project passes the screens or is otherwise determined to not adversely affect the transmission system, the utility provides the customer an executable interconnection agreement

The SGIP “study process” is lengthier and more detailed than the Fast Track or the Inverter-Based processes.²³ Within 10 business days of receiving a complete interconnection request, a scoping meeting must be held, unless otherwise mutually agreed by the parties. Not later than 5 business days after the scoping meeting, a utility must provide an interconnection customer with either a feasibility study agreement or a system impact study agreement. Within 30 business days of an interconnection customer’s agreement to conduct a feasibility study, the feasibility study must be completed and the feasibility study report transmitted. If a feasibility study shows no adverse system impacts and no additional facilities are needed, an interconnecting utility must provide an executable interconnection agreement within 5 business days.

If a feasibility study shows the potential for adverse system impacts, the interconnecting utility must provide a distribution system impact study agreement within 15 business days of transmittal of the feasibility study report. A distribution system impact study must be completed and transmitted within 30 business days of a system impact study agreement being signed, and a transmission system impact study must be completed and transmitted within 45 business days if required. Once a required system impact study(s) is completed, within 5 business days, the interconnecting utility must prepare a system impact study report and send it to the interconnection customer along with a facilities study agreement.

A facilities study must be completed and transmitted within 45 business days of the receipt of a facilities study agreement, if system upgrades are required, and within 30 business days if no system upgrades other than interconnection facilities are required. After the facilities study is completed, within 5 business days, the

²¹ *Id.* §. 1.1.1 and 3.1.

²² *Id.* §§ 1.3, 2.2 & Attachment 5

²³ *Id.* § 3 & Attachments 6, 7 & 8

interconnecting utility must provide the interconnection customer with an executable interconnection agreement.

Fees under the “study process” are not as certain as those under the other 2 tiers. A deposit of 50% of the reasonable estimate for the feasibility study or \$1000 dollars is required, and the full costs of the study are paid by the customer.

The SGIP neither requires nor prohibits an external disconnect switch for any size system, but it does direct 10 kW Inverter Process customers to check with the interconnecting utility before submitting an application to determine whether disconnection equipment is required.²⁴ The 10 kW Inverter Process also specifies that an interconnecting utility must have access to a disconnect switch if one is required.

B. IREC

The IREC Model is based directly off the SGIP. It maintains the technical standards, application forms and the simplified agreement for interconnection of inverter-based systems no larger than 10 kW. It also uses largely the same method as the SGIP model for any interconnections requiring utility system upgrades. There are several differences with general applicability, and a few which are specific to one of the four tiers used in the model procedures.

A first difference is that the IREC model does not allow a utility to require the customer to install an external disconnect switch provided it complies with the applicable IEEE and UL standards.²⁵ A similar provision applies to any additional testing that may be required by the utility for certified systems that are not listed in the IREC model.²⁶ Unlike the SGIP, the IREC model does not allow for interconnection to transmission lines.²⁷ This is probably to avoid any conflict with FERC jurisdiction. In the event, the interconnection is to a transmission line, the FERC’s SGIP would likely be required. Another difference is that a protective scheme is required for generation that would connect to a spot network if the generator or the generator in aggregate with others exceeds 5% of the spot network’s maximum load.²⁸ This is to ensure that its current flow will not affect the network’s protective devices, like reverse power relays.

²⁴ *Id.* at § 4.0.

²⁵ IREC Model Procedure § (j)(5).

²⁶ *Id.* at §§ (i)(7), (j)(5).

²⁷ *Id.* at § (d)(8).

²⁸ *Id.* at § (e).

A major difference between the two procedures is that the time for the utility to provide notice of whether an application is complete or incomplete is shortened with the IREC model from 10 days to 3 days.²⁹ In effect the IREC model shortens the notice of completeness to 3 days so that it lines up with the 3 day notice of receipt required in the SGIP. This shortens the time it takes from application to approval, and allows customers to get their equipment up and operating faster. A final difference that is not tier specific is that the dispute resolution provision allows for State PUC designation of a technical master to settle disputes, with a provision allowing the State PUC to review the costs for such resolution.³⁰ The model also allows for State specific dispute resolution or complaint procedures. The SGIP on the other hand requires the use of FERC ADR procedures, which is somewhat out of place for a state jurisdictional procedure.

There are a couple of important differences with respect to the first tier of review which applies to inverter-based systems no greater than 10kW. One is that if a utility fails to inform the customer whether the application is approved or disapproved within 20 days then the customer's application will be deemed approved.³¹ The second is that the application fee is substantially reduced from \$100 to \$20.³²

The second tier, for generators not greater than 2MW, is nearly the same in all important respects to the SGIP. An area where this tier differs from the SGIP is the fee structure for the applications is changed. Rather than a flat fee of \$500, the IREC form requires a fee of \$50 plus \$1 per kW of generator capacity.³³ This fee could potentially be higher than the SGIP, but for systems that are either not inverter-based or are just over the 10kW threshold for the first tier review it is likely to be substantially lower.

The third tier which applies to non-exporting generators that are no greater than 10MW is substantially the same as SGIP. As with the second tier, the biggest difference relates to the application fee. The IREC model requires \$100 plus \$1.50 per kW of the generator's capacity whereas the SGIP requires a deposit of 50% of the study cost estimates or \$1000 whichever is less.³⁴ Again as with the second tier, this fee could end up being more or less than that employed by the SGIP.

²⁹ *Id.* at §§ (f), (g), (h), (i).

³⁰ *Id.* at § (k).

³¹ IREC Model Procedure at § (f)(6).

³² *Id.* at § (f)(7).

³³ *Id.* at § (g) (9).

³⁴ *Id.* at § (h)(8)

The IREC is also different from the SGIP in that it adds a fourth tier, but this tier serves only to sectionalize some of the additional studies required under the SGIPs third tier if certain screens are not passed.³⁵ The fourth tier also allows for the generator to export through its interconnection. The studies under this tier include a scoping meeting with the utility. At the scoping meeting, the utility provides some information regarding fault currents, peak loads, and the line configurations in the electrical vicinity of the interconnection point. The parties may, by mutual agreement waive additional studies including any feasibility, impact, or facilities studies.³⁶ If not waived the utility provides the customer with good faith estimates of the study costs and time and the customer must pay for the studies. In addition to the study costs, there is a fee under this tier of \$100 plus \$2 per kW of generator capacity.³⁷ With each successive study the next study may be waived if it appears that it is not necessary to ensure that the interconnection will not have adverse impacts.

Unlike the SGIP's study procedures, the IREC model forecloses the utility from charging for review of the generator's protective equipment if the generator is certified by IEEE 1547. The utility may conduct and charge the customer for a review of the protective devices adherence to IEEE 1547. The IREC Model also sets the hourly rate for engineering review at \$100 per hour.³⁸

In its comments, IREC notes that it will be issuing a revised model interconnection procedure in April 2009. The revisions to the model are intended to capture the evolving "best practices" in the industry. IREC also comments that the revised model will be drafted so that it will apply to all state jurisdictional facilities rather than those that are below a certain size limitation. It recommends that the Commission adopt rules that will apply to all generation falling under state jurisdiction. IREC notes that this will avoid future conflict and spare the Commission and other interested persons the time and expense of drafting additional interconnection rules for those facilities in the future.

VI. COMMISSION RECOMMENDATIONS AND CONCLUSIONS

The Commission currently has the authority to implement statewide small generator interconnection standards and procedures through the adoption of rules. The Commission concludes that statewide interconnection procedures for Maine's utilities should be imposed. Standardized rules will increase the efficiency of the interconnection

³⁵ *Id.* at § (i)(1).

³⁶ *Id.* at § (i)(4).

³⁷ IREC Model Procedure at § (i)(20).

³⁸ *Id.* at § (j)(4).

process, encourage the increased use of renewable energy and the increased utilization of other distributed generation resources like micro combined heat and power systems, and may foster an easier business environment for the companies that sell and install small generation systems. Accordingly the Commission will proceed to initiate a rulemaking process to consider statewide interconnection standards.

Given that two of the utilities already use the FERC's SGIP, it makes sense to use the SGIP, or a model rule like IREC's which is closely based on the SGIP. This will make the transition to the statewide procedure easier and less expensive for those utilities, because they will already be fairly familiar with the process.

Though the differences between the FERC developed SGIP and IREC's model small generator interconnection procedures are relatively minor, the IREC model appears more desirable. Each is acceptable as a model for a statewide rule, but the latter is somewhat less burdensome to utility customers who are seeking to interconnect small generation to their utility's distribution system. In recognition of the revisions to IREC's model rules that are forthcoming in April 2009 the Commission will likely begin its rulemaking on or about that time so that it may take advantage of potential improvements to the current model. Specifically the Commission is interested reviewing the expansion of the IREC model to all State jurisdictional facilities, and the incorporation of current "best practices." If adequately addressed by the new IREC model these provisions may serve to avoid additional rulemakings for facilities larger than 5 MW, and go further towards meeting Maine's policy goals.

The IREC model's lower and sliding scale fees reduce the initial cost burden to consumers seeking interconnection. This on its own will help make small generation more attractive to consumers. The IREC, through its foreclosure of an external disconnect switch, more fully recognizes the value of the IEEE and UL standards governing inverter-based systems with capacity at or below 10 kW. It is further more specifically designed for state jurisdictional interconnections, whereas the SGIP is geared somewhat more towards generation that could fall under the FERC's jurisdiction. This is especially the case with respect to the dispute resolution provisions. Therefore, the Commission anticipates that it will base its initially proposed rules on the IREC model, which owes much of its structure to the SGIP in an effort to advance the goals of encouraging the installation and use of renewable power, and other efficient small generation technology.

As a model rule, the IREC's procedures may include provisions that are not suitable for Maine's system or its utilities. The fee structures may need to be adjusted to some extent in order to account for the actual time and expense that Maine's utilities will incur with each interconnection application. The hourly rate for engineer's who will work on the interconnection requests may not reflect the going rate for these services in the State. There may be other issues that the utilities and other stakeholders feel are not adequately addressed by the IREC model rule. These issues can be addressed in a Commission rulemaking proceeding to adopt statewide interconnection standards.