

173 FERC ¶ 61,226  
UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

18 CFR Part 292

[Docket Nos. RM21-2-000 and RM20-20-000; Order No. 874]

Fuel Cell Thermal Energy Output  
Bloom Energy Corporation

(Issued December 17, 2020)

AGENCY: Federal Energy Regulatory Commission.

ACTION: Final rule.

SUMMARY: In this final rule, the Federal Energy Regulatory Commission amends the definition of useful thermal energy output in its regulations implementing the Public Utility Regulatory Policies Act of 1978 to recognize the technical evolution of cogeneration.

EFFECTIVE DATE: This rule will become effective **[Insert Date 60 days after the date of publication in the FEDERAL REGISTER]**

FOR\_FURTHER INFORMATION CONTACT:

Lawrence R. Greenfield (Legal Information)  
Office of the General Counsel  
Federal Energy Regulatory Commission  
888 First Street, NE  
Washington, DC 20426  
(202) 502-6415  
lawrence.greenfield@ferc.gov

Helen Shepherd (Technical Information)  
Office of Energy Market Regulation  
Federal Energy Regulatory Commission  
888 First Street, NE  
Washington, DC 20426  
(202) 502-6176  
[helen.shepherd@ferc.gov](mailto:helen.shepherd@ferc.gov)

Thomas Dautel (Technical Information)  
Office of Energy Policy and Innovation  
Federal Energy Regulatory Commission  
888 First Street, NE  
Washington, DC 20426  
(202) 502-6196  
[thomas.dautel@ferc.gov](mailto:thomas.dautel@ferc.gov)

SUPPLEMENTARY INFORMATION:

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FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: James P. Danly, Chairman;  
Neil Chatterjee and Richard Glick.

Fuel Cell Thermal Energy Output  
Bloom Energy Corporation

Docket Nos. RM21-2-000  
RM20-20-000

ORDER NO 874

FINAL RULE

(Issued December 17, 2020)

**I. Introduction**

1. In this final rule, the Federal Energy Regulatory Commission (Commission) revises its regulations (PURPA Regulations)<sup>1</sup> implementing sections 201 and 210 of the Public Utility Regulatory Policies Act of 1978 (PURPA)<sup>2</sup> in light of the development of fuel cell systems with integrated hydrocarbon reformation equipment as a technical evolution of cogeneration.
2. On October 15, 2020, the Commission issued a notice of proposed rulemaking (NOPR) proposing to modify the PURPA Regulations.<sup>3</sup> Bloom Energy, Edison Electric

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<sup>1</sup> 18 CFR Part 292.

<sup>2</sup> 16 U.S.C. 796, 824a-3.

<sup>3</sup> *Fuel Cell Thermal Energy Output*, Notice of Proposed Rulemaking, 85 FR 67,699 (Oct. 26, 2020), 175 FERC ¶ 61,050 (2020) (NOPR).

Institute (EEI), and FuelCell Energy, Inc. (FuelCell Energy) responded with comments and the California Public Utilities Commission filed a notice of intervention. Bloom Energy also filed a motion to submit reply comments, and reply comments, to the comments of FuelCell Energy and EEI.

3. This final rule addresses the comments received in response to the NOPR. With one modification, we adopt the proposed revisions in the NOPR.

## II. Background

4. PURPA was part of a legislative package Congress enacted in 1978 to address the energy crisis then facing the country.<sup>4</sup> As the Supreme Court explained in *FERC v. Mississippi*,<sup>5</sup> Congress was aware that domestic oil production had lagged behind demand, and the country had become increasingly dependent on foreign oil – which could jeopardize the country’s economy and undermine its independence.<sup>6</sup> Roughly a third of the nation’s electricity was generated using oil and natural gas,<sup>7</sup> and Congress concluded that increased reliance on cogeneration and small power production could

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<sup>4</sup> See Pub. L. No. 95-617, 92 Stat. 3117 (1978). In addition to PURPA, that legislative package included: the Energy Tax Act of 1978, Pub. L. No. 95-618, 92 Stat. 3174; the National Energy Conservation Policy Act, Pub. L. No. 95-619, 92 Stat. 3206; the Powerplant and Industrial Fuel Use Act of 1978, Pub. L. No. 95-620, 92 Stat. 3289; and the Natural Gas Policy Act of 1978, Pub. L. No. 95-621, 92 Stat. 3351.

<sup>5</sup> 456 U.S. 742 (1982).

<sup>6</sup> *Id.* at 756.

<sup>7</sup> *Id.* at 745.

significantly contribute to conserving this energy.<sup>8</sup> As recognized by the Supreme Court, Congress passed PURPA to address the impacts of oil and natural gas shortages (and electric utilities' decreasing efficiency in their generating capacities) on customer rates and the economy as a whole.<sup>9</sup>

5. PURPA section 210 was intended to address the energy crisis by encouraging the development of QFs and thereby reducing the country's demand for traditional fossil fuels.<sup>10</sup> PURPA section 210(a) thus directed that the Commission "prescribe, and from time to time thereafter revise, such rules as [the Commission] determines necessary to encourage cogeneration and small power production."<sup>11</sup>

6. In 1980, the Commission issued Order No. 70, which promulgated rules that, as relevant here, largely remain in effect today.<sup>12</sup> Order No. 70 established the "criteria and

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<sup>8</sup> *Id.* at 757.

<sup>9</sup> *Id.* at 745-46.

<sup>10</sup> *Id.* at 750.

<sup>11</sup> 16 U.S.C. 824a-3(a).

<sup>12</sup> *Small Power Production and Cogeneration Facilities – Qualifying Status*, Order No. 70, 45 FR 17959 (Mar. 20, 1980), FERC Stats. & Regs. ¶ 30,134 (cross-referenced at 10 FERC ¶ 61,230), *order on reh'g*, Order No. 70-A, 45 FR 33603 (May 20, 1980), FERC Stats. & Regs. ¶ 30,159 (cross-referenced at 11 FERC ¶ 61,119), *order on reh'g*, Order No. 70-B, 45 FR 52779 (Aug. 4, 1980), FERC Stats. & Regs. ¶ 30,176 (cross-referenced at 12 FERC ¶ 61,128), *order on reh'g*, 45 FR 66784 (Oct. 8, 1980) FERC Stats. & Regs. ¶ 30,192 (1980) (cross-referenced at 12 FERC ¶ 61,306), *amending regulations*, Order No. 70-D, 46 FR 11251 (Feb. 6, 1981), FERC Stats. & Regs. ¶ 30,234 (cross-referenced at 14 FERC ¶ 61,076), *amending regulations*, Order No. 70-E, 46 FR 33025 (Jun. 26, 1981) FERC Stats. & Regs. ¶ 30,274 (1981) (cross-referenced at 15 FERC ¶ 61,281)

procedures by which small power producers and cogeneration facilities can obtain qualifying status to receive the rate benefits and exemptions” contained in PURPA section 210.<sup>13</sup> As relevant here, the Commission established criteria for a cogeneration QF, a facility that, as required by the statute, “produces (i) electric energy, and (ii) steam or forms of useful energy (such as heat) which are used for industrial, commercial, heating or cooling purposes.”<sup>14</sup>

7. In enacting PURPA, Congress could not, and did not, predict specific technological developments that would occur in future years but instead recognized the Commission’s discretion by directing the Commission to “from time to time thereafter revise such rules as it determines necessary to encourage cogeneration.”<sup>15</sup> Although in 1978 the predominant form of cogeneration was a more traditional combined heat and power, Congress did not limit the definition of qualifying cogeneration facilities to the particular technologies then in existence. Instead, as described above, Congress defined a cogeneration facility as a facility that produces: (1) electric energy; and (2) steam or forms of useful energy, such as heat, which are used for industrial, commercial, heating or cooling purpose.<sup>16</sup> Congress otherwise left it for the Commission, from time to time,

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<sup>13</sup> Order No. 70, FERC Stats. & Regs. ¶ 30,134 at 30,933.

<sup>14</sup> 16 U.S.C. 796(18); *accord* 18 CFR 292.202(c).

<sup>15</sup> 16 U.S.C. 824a-3(a).

<sup>16</sup> *See supra* note 14.

to determine the types of facilities that would qualify as cogeneration facilities under the statute.

8. Unlike more traditional electric generation that relies on combustion of fossil fuels to produce electric energy, fuel cells convert the chemical energy in hydrogen to electric energy without combustion. This conversion has been characterized as a significant improvement in the efficiency of electric generation.<sup>17</sup> More specifically, hydrogen fuel – which can be produced from the application of heat and steam to hydrocarbons such as natural gas – enters the anode side of the fuel cell. Simultaneously, ambient air enters the cathode side of the fuel cell. The hydrogen fuel on the anode attracts oxygen ions from the cathode. The resulting electrochemical reaction produces electricity plus heat and steam that can be used up front to reform natural gas on-site to produce the hydrogen that fuels the fuel cell.<sup>18</sup>

9. If the natural gas reformation equipment were instead located offsite, then waste heat (in the form of steam) from the electricity production by the fuel cell would not be available to aid the reformation process to fuel the cell. In this offsite reformation scenario, we would expect the external reformation process to require additional natural gas to be burned to create steam so that the remainder of the input natural gas could be

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<sup>17</sup> Bloom Energy Petition at 8.

<sup>18</sup> *Id.*

reformed into hydrogen.<sup>19</sup> This would be inefficient and inconsistent with Congress's goal in enacting PURPA, as discussed above.

10. Stated another way, integrating the natural gas reformation process into a fuel cell generating facility results in significant "progress in the development of efficient electric energy generating technology."<sup>20</sup>

### **III. NOPR Proposal**

11. In the NOPR, the Commission stated that the statutory definition of cogeneration facilities requires that a cogeneration facility produce "(i) electric energy, and (ii) steam or forms of useful energy (such as heat) which are used for industrial, commercial, heating or cooling purposes."<sup>21</sup> This definition provides for steam or other forms of useful energy to be used for, e.g., an industrial purpose. The creation by a fuel cell system with an integrated natural gas reformation process of a commercially valuable fuel, as described in the NOPR, would fit within the scope of this statutory definition. Consistent with the PURPA Regulations, fuel cell systems with integrated natural gas reformation equipment produce two forms of energy: electricity, and the heat/steam (thermal energy) used to create the hydrogen that fuels the fuel cell system (a chemical energy).

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<sup>19</sup> Furthermore, because hydrogen is frequently compressed or liquified for shipment to the point of consumption, more energy would be needed for these activities. *Id.* at 8 & App. B.

<sup>20</sup> *Id.* at 1, 3, 7, 16 (citing 16 U.S.C. 824a-3(n)(1)(A)(iii)).

<sup>21</sup> 16 U.S.C. 796(18)(A).



12. The Commission's PURPA Regulations define a topping-cycle cogeneration facility as a cogeneration facility in which the energy input to the facility is first used to produce useful power output and at least some of the reject heat from the power production process is then used to provide useful thermal energy.<sup>22</sup>

13. Fuel cell systems with integrated natural gas reformation equipment convert the chemical energy within natural gas into electricity using a steam-methane reformation process,<sup>23</sup> which essentially converts the methane in the natural gas input to hydrogen, which then reacts with oxygen in the fuel cell to produce electricity. The by-product of the fuel cell's production of electricity is heat and steam, some of which can be used in the steam-methane reformation process to convert more methane into hydrogen, which the fuel cells use, in combination with oxygen from the air, to produce electricity.

14. As a cogeneration QF is one that "produces electric energy as well as steam or forms of useful energy (such as heat) which are used for industrial, commercial, heating or cooling purposes,"<sup>24</sup> consistent with the PURPA Regulations, fuel cell systems with

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<sup>22</sup> 18 CFR 292.202(d).

<sup>23</sup> Industrial gas manufacturers also produce hydrogen from natural gas using a steam-methane reformation process, but must produce their own steam, usually through combustion of some of the input natural gas. Because the buyers of the resulting hydrogen are usually remote from the industrial gas manufacturer, this hydrogen is either compressed or liquified in order to transport the hydrogen to the end user. Integrating the natural gas steam reformation process into a fuel cell system increases efficiency and avoids the energy loss of external reformation, and compression or liquefaction for surface transportation. Bloom Energy Petition at 8 & App. B.

<sup>24</sup> 16 U.S.C. 796(18).

integrated natural gas reformation equipment generate two forms of useful energy – electricity, and heat/steam (thermal energy) that is used to produce hydrogen (a chemical energy).

15. The PURPA Regulations identify three categories of useful thermal output from a topping-cycle cogenerator. They are thermal energy (1) that is “made available to an industrial or commercial process ...; (2) that is used in a heating application ...; or (3) that is used in a space cooling application.”<sup>25</sup> In the NOPR, the Commission proposed to amend its regulations to provide that the production of heat/steam by a solid oxide fuel cell system for use in an integrated natural gas reformation process to produce hydrogen yields a useful thermal energy output made available to an industrial process that, as described in the NOPR, entitles such a system to be considered a topping cycle cogeneration facility that qualifies, subject to meeting the other relevant requirements,<sup>26</sup> to be a QF. The Commission stated that the recent technological advances in utilizing the thermal energy from a solid oxide fuel cell in an integrated steam hydrocarbon reformation process were not known or anticipated when the Commission adopted its

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<sup>25</sup> 18 CFR 292.202(h).

<sup>26</sup> See 18 CFR 292.203(b), 292.205. If the cogeneration facility is a “new” qualifying cogeneration facility “seeking to sell electric energy pursuant to [PURPA section 210],” such facility must meet certain additional requirements. 16 U.S.C. 824a-3(n); accord 18 CFR 292.205(d) (implementing PURPA section 210(n), by requiring an additional showing for certain cogeneration facilities that are “seeking to sell electric energy pursuant to [PURPA] section 210”).

original definitions for useful thermal energy, but that fact should not stand in the way of the Commission now recognizing such advances and responding accordingly.<sup>27</sup>

16. In recognition of technological advancements over the past 40 years and Congress's commitment to "continuing progress in the development of efficient electric energy generating technology,"<sup>28</sup> and in light of the development and commercialization of fuel cell systems with integrated natural gas reformation equipment since the original adoption of the PURPA Regulations, the Commission proposed in the NOPR to amend section 292.202(h) of the PURPA Regulations by adding a new paragraph providing that useful thermal energy output include the thermal energy that is used by a solid oxide fuel cell system with an integrated steam hydrocarbon reformation process for production of fuel for electricity generation.<sup>29</sup>

17. In proposing this change to its regulations, the Commission did not propose to revise section 292.205(d) of the PURPA Regulations, which establishes additional criteria for, in particular, new cogeneration facilities seeking to sell electric energy pursuant to PURPA section 210.<sup>30</sup> The Commission proposed that any new cogeneration

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<sup>27</sup> See *infra* note 53.

<sup>28</sup> 16 U.S.C. 824a-3(n)(1)(A)(iii).

<sup>29</sup> NOPR, 175 FERC ¶ 61,050 at PP 1, 3, 7, 10-11.

<sup>30</sup> 18 CFR 292.205(d); see also 18 CFR 292.205(d)(4) ("For purposes of paragraphs (d)(1) and (2) of this section, a new cogeneration facility of 5 MW or smaller will be presumed to satisfy the requirements of those paragraphs."). That presumption for 5 MW or smaller facilities is a rebuttable presumption, though.

facility that is a solid oxide fuel cell system with an integrated steam hydrocarbon reformation process would be required to satisfy the existing criteria of section 292.205(d) of the PURPA Regulations if it seeks to make sales of electric energy pursuant to PURPA section 210.

#### **IV. Comments**

18. FuelCell Energy, which explains that it operates fuel cell systems on three continents that have generated over 10 billion kWh of power, asks the Commission to revise its regulations to encompass more than just solid oxide fuel cell systems. FuelCell Energy asserts that Bloom Energy requested that the Commission expand its current definition of a cogeneration facility so that Bloom Energy's solid oxide fuel cells qualify as a QF. FuelCell Energy argues that the Commission should revise the definition, so it can apply more broadly to any fuel cell systems that use waste heat for the reforming of fuel to produce hydrogen, and not just Bloom Energy's solid oxide fuel cell system.<sup>31</sup>

19. FuelCell Energy asserts that its carbonate fuel cells use waste heat in an integrated fuel reforming process to produce hydrogen,<sup>32</sup> just as Bloom Energy's solid oxide fuel cells do. FuelCell Energy contends that, as long as fuel cell systems use waste heat for the reforming of hydrocarbon fuel to produce hydrogen, the particular fuel cell

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*Revised Regulations Governing Small Power Production and Cogeneration Facilities*, Order No. 671, 114 FERC ¶ 61,102, at PP 26, 60, *order on reh'g*, Order No. 671-A, 115 FERC ¶ 61,225 (2006).

<sup>31</sup> FuelCell Energy Comments at 5, 7.

<sup>32</sup> *Id.* at 6.

technology should not be exclusive or exclusionary; so long as there is no efficiency tradeoffs or additional negative environmental impacts, the type of fuel cell technology (whether carbonate or solid oxide) should be irrelevant.<sup>33</sup>

20. EEI requests that the Commission not move forward with this final rule, arguing that the Commission cannot expand the statutory definition of a cogeneration facility.<sup>34</sup>

EEI asserts that fuel cell technology does not meet the statutory requirements to be certified as a cogeneration facility. EEI agrees that the Commission is charged with implementing PURPA through adoption of regulations but argues that, in doing so, the Commission is limited by the statutory requirements. EEI states that, to qualify as a QF, a cogeneration facility must meet the statutory definition of a cogeneration facility, i.e., it must be a facility which produces: (1) electric energy and (2) steam or forms of useful energy (such as heat) which are used for industrial, commercial, heating or cooling purposes.<sup>35</sup>

21. EEI also points out that the statute requires that the Commission establish regulations that ensure that:

(i) the thermal energy output of a new qualifying cogeneration facility is used in a productive and beneficial manner;

(ii) the electrical, thermal, and chemical output of the cogeneration facility is used fundamentally for industrial, commercial, or institutional purposes and is not intended fundamentally for sale to an electric utility, taking into account

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<sup>33</sup> *Id.* at 5.

<sup>34</sup> EEI Comments at 2.

<sup>35</sup> *Id.* at 4 (quoting 16 U.S.C. 796(18)).

technological, efficiency, economic, and variable thermal energy requirements, as well as State laws applicable to sales of electric energy from a qualifying facility to its host facility; and

(iii) continuing progress in the development of efficient electric energy generating technology.<sup>36</sup>

22. EEI argues that this statutory language indicates that, contrary to the Commission's statement in the NOPR, the definition of cogeneration is not "open-ended."<sup>37</sup> EEI recognizes that other technologies may qualify as cogeneration facilities under the statute but argues that the fuel cell technology described in the NOPR does not meet the statutory requirement.<sup>38</sup>

23. EEI explains that the solid oxide fuel cell system described in the NOPR appears to be a self-contained reaction that is designed to produce electricity and thus is inconsistent with the statutory requirement.<sup>39</sup> EEI explains that, in Order No. 70, the Commission defined a cogeneration facility as one that

produces electric energy and steam or forms of useful energy (such as heat) which are used for industrial, commercial, heating, or cooling purposes. Thus, cogeneration facilities simultaneously produce two forms of useful energy, namely electric power and heat. Cogeneration facilities can use significantly less fuel to produce electricity and steam (or other forms of energy) than would be needed to produce the two separately. By using the fuels more efficiently

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<sup>36</sup> *Id.* (quoting 16 U.S.C. 824a-3(n)).

<sup>37</sup> *Id.* (referencing NOPR, 175 FERC ¶ 61,050 at P 3).

<sup>38</sup> *Id.*

<sup>39</sup> *Id.* at 6.

cogeneration facilities can make a significant contribution to the Nation's effort to conserve its energy resources.<sup>40</sup>

24. Further, EEI explains that there is

an explicit requirement for the sequential use of energy in cogeneration facilities. This means that rejected heat from a power production or heating process is used in another power production or heating process. It is precisely this “cascading” use of energy in sequential processes that gives rise to the energy conserving characteristics of cogeneration.<sup>41</sup>

25. EEI explains that, in adopting this provision in Order No. 70, the Commission clarified the facilities eligible for QF status did not include natural gas-fired combined-cycle combustion plants even though the sequential use of heat is used to produce more electricity.<sup>42</sup> EEI argues that the main difference between a solid oxide fuel cell and a natural gas-fired combined-cycle facility is that the solid oxide fuel cell produces electricity from natural gas through a chemical reaction instead of combustion, which is not a meaningful distinction because “[i]f the thermal energy uses were not required to be completely independent of the power production processes many conventional generating facilities could be considered cogeneration facilities and may be eligible for the benefits of section 210 of PURPA.”<sup>43</sup>

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<sup>40</sup> *Id.* (quoting Order No. 70, FERC Stats. & Regs. ¶ 30,134 at 30,931-32).

<sup>41</sup> *Id.* (quoting Order No. 70, FERC Stats. & Regs. ¶ 30,134 at 30,934).

<sup>42</sup> *Id.* at 6-7.

<sup>43</sup> *Id.* at 7 (quoting *EG&G, Inc.*, 16 FERC ¶ 61,060, at 61,104 (1981)).

26. EEI argues that allowing solid oxide fuel cells to now qualify as cogeneration is inconsistent with the rationale behind encouraging cogeneration under PURPA. EEI explains that, in Order No. 70, the Commission recognized that the goal was to promote conservation by recognizing that the production of electricity often creates a byproduct, thermal energy, and with minimal additional fuel the cogenerators could produce large amounts of thermal energy that could be used in other processes.<sup>44</sup> EEI asserts that solid oxide fuel cells' primary purpose is to produce more electricity instead of using the thermal energy for another, independent purpose.

27. Finally, EEI argues that, in the past, the Commission has remained technology neutral; yet, here, the Commission is proposing to change its PURPA Regulations to endorse a specific technology. EEI requests that, instead of changing the regulations to accommodate specific technologies, the Commission evaluate new technologies under statutory criteria and the goals of PURPA to ensure a level playing field for all technologies.

28. Bloom Energy filed comments reiterating its support for the revision of the Commission's PURPA Regulations, contending that the revised definition "represents a narrow, targeted form of regulatory relief necessary to ensure 'continuing progress in the development of efficient electric energy generating technology' and ...would not impact the application of the 'fundamental use test' or the existing operating standards applicable

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<sup>44</sup> *Id.*



to cogeneration facilities.”<sup>45</sup> Bloom Energy asserts that fuel cells provide several public policy benefits such as grid reliability and resiliency of electric supply. Bloom Energy includes a Joint Declaration from former Commissioners Vicky A. Bailey, Norman C. Bay, Nora Mead Brownell, Suedeem G. Kelly, and William L. Massey, who note their support of the NOPR and state that the “proposed change is consistent with the statutory text of PURPA and the definition of ‘cogeneration facility’ in the [FPA] ....”<sup>46</sup>

Subsequently, Bloom Energy filed reply comments in response to the comments of FuelCell Energy and EEI.

## V. Discussion

29. In this final rule, we adopt a revision to the definition of a topping-cycle cogeneration facility in section 292.202(h) of the PURPA Regulations, as proposed in the NOPR, with one modification, to include all fuel cells that use waste heat in an integrated fuel reforming process, instead of limiting the type of eligible fuel cells to only solid oxide fuel cells.<sup>47</sup>

30. The statutory definition of cogeneration facilities requires only that a cogeneration facility produce “(i) electric energy, and (ii) steam or forms of useful energy (such as

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<sup>45</sup> Bloom Energy Comments at 7 (referencing Bloom Energy Petition at 1-2) (internal quotations omitted).

<sup>46</sup> Bloom Energy Comments, Joint Declaration at 3.

<sup>47</sup> We recognize that the integrated fuel reforming process can use hydrocarbons other than just natural gas but also, e.g., bio-gas. The regulatory text’s reference to “an integrated steam hydrocarbon reformation process” thus encompasses not only use of natural gas in the reformation process but also use of other hydrocarbons such as bio-gas.

heat) which are used for industrial, commercial, heating or cooling purposes ....”<sup>48</sup> This definition explicitly provides for steam or other forms of useful energy to be used for an industrial purpose. Because, as described above, a fuel cell system with an integrated hydrocarbon reformation process creates useful thermal energy in that it is used for an industrial purpose – here, producing a commercially valuable fuel, hydrogen -- it fits within this statutory definition. Phrased differently, fuel cell systems with integrated hydrocarbon reformation equipment produce two forms of useful energy: electric energy and heat/steam (thermal energy) which can be used to produce hydrogen (from which chemical energy can be used to produce electric energy).

31. Currently, the Commission’s PURPA Regulations as adopted in 1980 provide that a topping-cycle cogeneration facility is a cogeneration facility in which the energy input to the facility is first used to produce useful power output and at least some of the reject heat from the power production process is then used to provide useful thermal energy.<sup>49</sup> Fuel cell systems with integrated hydrocarbon reformation equipment convert the chemical energy of the methane within natural gas into hydrogen and, ultimately, electricity using a steam-methane reformation process,<sup>50</sup> which converts the natural gas

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<sup>48</sup> 16 U.S.C. 796(18)(A).

<sup>49</sup> 18 CFR 292.202(d).

<sup>50</sup> As explained in the NOPR, and described again above, industrial gas manufacturers also produce hydrogen from natural gas using a steam-methane reformation process but must produce their own steam, usually through combustion of some of the input natural gas. Because the buyers of the resulting hydrogen are usually

input to hydrogen, which reacts with oxygen in the fuel cell to produce electricity. The by-product of the fuel cell's production of electricity is heat and steam, some of which is used in the integrated hydrocarbon reformation process to convert more natural gas into hydrogen, which the fuel cells use, in combination with oxygen from the air, to produce electricity.

32. A cogeneration facility is, per the statute, one that “produces electric energy as well as steam or forms of useful energy (such as heat) which are used for industrial, commercial, heating or cooling purposes.”<sup>51</sup> Consistent with this language, fuel cell systems with integrated hydrocarbon reformation equipment do exactly that and thus can be cogeneration facilities. Fuel cells, as noted above, generate two forms of useful energy – electricity and the heat/steam (thermal energy) that is used to produce hydrogen. The Commission thus amends its PURPA Regulations to provide that the production of heat/steam by a fuel cell system with an integrated hydrocarbon reformation process to produce hydrogen yields a “useful thermal energy output” made available to an industrial process that entitles such a system, consistent with the statute’s requirements for a

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remote from the industrial gas manufacturer, this hydrogen is either compressed or liquified in order to transport the hydrogen to the end user. Integrating the hydrocarbon reformation process into a fuel cell system increases efficiency and avoids the energy loss of external reformation and compression or liquefaction for surface transportation.

<sup>51</sup> 16 U.S.C. 796(18).

cogeneration facility, to be considered a topping cycle cogeneration facility that can qualify, subject to meeting the other relevant requirements,<sup>52</sup> to be a QF. The technological advances in fuel cells that have occurred since 1980 were neither known nor anticipated when the Commission adopted its original definitions for useful thermal energy, but that fact should not stand in the way of the Commission now recognizing such advances and responding accordingly.<sup>53</sup>

33. In sum, recognizing technological advancements over the past 40 years and Congress's commitment to "continuing progress in the development of efficient electric energy generating technology,"<sup>54</sup> and in light of the development and commercialization of fuel cell systems with integrated hydrocarbon reformation equipment since the original adoption of the PURPA Regulations, we amend section 292.202(h) of the PURPA Regulations by adding a new paragraph to provide that "useful thermal energy output" includes the thermal energy that is used by a fuel cell system with an integrated steam

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<sup>52</sup> See 18 CFR 292.203(b), 292.205. If the facility is a "new" cogeneration facility that seeks to sell electric energy pursuant to PURPA section 210, it will also need to meet the additional requirements applicable to such facilities. 16 U.S.C. 824a-3(n); 18 CFR 292.205(d).

<sup>53</sup> We recognize that, in *EG&G, Inc.*, the Commission stated that, for cogeneration, "the use of thermal energy must be completely independent of the power production process." *EG&G, Inc.*, 16 FERC at 61,104. Even aside from the fact that that order did not involve fuel cells, it was issued under the regulations then effective, which we revise here. See *id.* at 61,103-04. In short, it was based on the regulations as adopted in 1980, and it has now been overtaken by the change in the PURPA Regulations adopted today.

<sup>54</sup> 16 U.S.C. 824a-3(n)(1)(A)(iii).

hydrocarbon reformation process for production of hydrogen to be used, ultimately, as fuel for electricity generation.

34. We also note that the thermal energy output, i.e., the waste heat, from the fuel cell that is used to reform natural gas into hydrogen fuel is used in a sequential process to create additional electricity and is more efficient and uses less fuel than fuel cells without integrated fuel reforming systems. This technology did not exist when the Commission established the regulations in Order No. 70. In this final rule, we now update our cogeneration regulations to include fuel cells with an integrated steam hydrocarbon reformation process. Combined-cycle electric generation, while admittedly a more efficient form of electric generation than, for example, a combustion turbine, is still not the same thing as a fuel cell system with an integrated steam hydrocarbon reformation process and does not warrant being identified as a qualifying facility.

35. FuelCell Energy argues that the NOPR proposal endorsed a specific technology, solid oxide fuel cells, instead of establishing standards that would apply to all similar fuel cells. We agree. The Commission has not endorsed specific types of solar panels, for example, in defining small power production facilities. Here, as FuelCell Energy recognizes, the focus should be on the integrated use of waste heat for reforming hydrocarbons to produce hydrogen to fuel a fuel cell, instead of the specific fuel cell technology utilized to accomplish that goal (i.e., solid oxide or carbonate). As such, we modify the proposed definition in the NOPR to state that useful thermal energy output includes the thermal energy that is used by a fuel cell system with an integrated steam hydrocarbon reformation process for production of fuel for electricity generation.

36. Finally, as we have noted above, we reiterate that “new” cogeneration facilities seeking to sell electric energy pursuant to PURPA section 210 must meet the additional requirements imposed by PURPA section 210 and the implementing regulations, that the “thermal energy output . . . is used in a productive and beneficial manner”<sup>55</sup> and that “[t]he electrical, thermal, chemical and mechanical output of the cogeneration facility is used fundamentally for industrial, commercial, residential or institutional purposes and is not intended fundamentally for sale to an electric utility.”<sup>56</sup> These requirements apply to fuel cell systems subject to the revised regulations adopted in this final rule.

## **VI. Information Collection Statement**

37. The Paperwork Reduction Act<sup>57</sup> requires each federal agency to seek and obtain the Office of Management and Budget’s (OMB) approval before undertaking a collection of information (including reporting, record keeping, and public disclosure requirements) directed to ten or more persons or contained in a rule of general applicability. OMB regulations require approval of certain information collection requirements contemplated

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<sup>55</sup> 18 CFR 292.205(d)(1).

<sup>56</sup> 18 CFR 292.205(d)(2). *See also* Energy Policy Act of 2005, Pub. L. No. 109-58, 1253, 119 Stat. 594, 967-70 (2005); Order No. 671, 114 FERC ¶ 61,102, *order on reh’g*, Order No. 671-A, 115 FERC ¶ 61,225.

<sup>57</sup> 44 U.S.C. 3501-21.

by proposed rules (including deletion, revision, or implementation of new requirements).<sup>58</sup>

Upon approval of a collection of information, OMB will assign an OMB control number and an expiration date. Respondents subject to the filing requirements of a rule will not be penalized for failing to respond to the collection of information unless the collection of information displays a valid OMB control number.

**Public Reporting Burden:** The Commission is revising its regulations implementing PURPA. The revision provides that useful thermal energy outputs will now include the thermal energy “that is used by a fuel cell system with an integrated steam hydrocarbon reformation process for production of fuel for electricity generation.” Below, the table includes estimated changes to the burden and cost of the FERC Form No. 556A<sup>59</sup> due to this final rule. As demonstrated by the table, we believe that some respondents may file multiple Form No. 556As in order to avail themselves of the revision in the regulations adopted above.<sup>60</sup>

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<sup>58</sup> See 5 CFR 1320.11.

<sup>59</sup> The change to the FERC-556 to reflect the change in the regulations adopted by this final rule is being submitted under a temporary interim information collection number, FERC-556A (OMB Control No. 1902-0316) because another change to FERC-556 (OMB Control No. 1902-0075) is pending OMB review and only one change per OMB Control No. can be pending for OMB review at a time.

<sup>60</sup> The changes to the FERC Form No. 556 adopted in Order No. 872 are pending OMB review (under ICR #202006-1902-004). Those changes are separate and are not affected by or addressed in this final rule.

FERC-556A, Certification of Qualifying Facility Status for a Small Power Production or Cogeneration Facility, Changes Due to final rule in Docket Nos. RM21-2-000 and RM20-20-000 <sup>61</sup>							
Facility Type	Filing Type	Number of Respondents (1)	Annual Number of Responses per Respondent (2)	Total Number of Responses (1)*(2)=(3)	Average Burden Hours & Cost Per Response (4)	Total Annual Burden Hours & Total Annual Cost (3)*(4)=(5)	Annual Cost per Respondent (\$) (5)÷(1)
Cogeneration Facility ≤ 1 MW <sup>62</sup>	Self-certification	5	600 <sup>63</sup>	3,000	1.5 hrs.; \$124.50	4,500 hrs.; \$373,500	\$74,700
Cogeneration Facility > 1 MW	Self-certification	5	20	100	1.5 hrs.; \$124.50	1,500 hrs.; \$12,450	\$2,490
Cogeneration Facility > 1 MW	Application for FERC certification	5	1	5	50 hrs.; \$4,150	250 hrs.; \$20,750	\$4,150
<b>FERC-556A, TOTAL ADDITIONAL BURDEN AND COST DUE TO final rule in RM21-2 and RM20-20</b>		<b>15</b>		<b>3,105</b>		<b>6,250 hrs.; \$406,700</b>	

<sup>61</sup> The figures in this table reflect estimated changes to the current OMB-approved inventory for the FERC Form No. 556. *Commission Information Collection Activities (FERC-556); Comment Request; Extension*, Docket No. IC19-16-000 (issued May 15, 2019 and approved by OMB on November 18, 2019). The above table only reflects cogeneration facilities because small power production facilities will not be affected by the changes in this final rule. The Commission staff believes that the industry is similarly situated to the Commission in terms of wages and benefits. Therefore, cost estimates are based on FERC's 2020 average hourly wage (and benefits) of \$83.00/hour.

<sup>62</sup> Such facilities are not required to file but have the choice whether to do so.

<sup>63</sup> Bloom Energy has stated they have 600 facilities, each with an average size of 0.6 MW, *see* Bloom Energy Petition at 14, which, if they all were in fact to file, would result in as many as 600 self-certifications of below-1 MW facilities. The Commission accordingly will adopt a conservative approach and estimate 600 such responses over the course of a year, which is especially conservative given that the Commission's regulations do not require below-1 MW facilities to submit self-certifications.

While FuelCell Energy also states that, to date, it has over 250 MW of fuel cells (but of unknown size) installed, in backlog, or under award on three continents, our burden estimate of as many as five respondents self-certifying up to 600 units annually each is sufficiently large to encompass any such self-certifications.



**Title:** FERC-556A (Certification of Qualifying Facility (QF) Status for a Small Power Production or Cogeneration Facility)

**Action:** Revisions to existing information collection FERC-556-A.<sup>64</sup>

**OMB Control No.:** 1902-0316

**Respondents:** Facilities that are self-certifying their status as a cogenerator or that are submitting an application for Commission certification of their status as a cogenerator.

**Frequency of Information:** Ongoing.

**Necessity of Information:** The Commission directs the changes in this final rule in order to revise its implementation of PURPA in light of technological advancements in electric generation since the enactment of PURPA in 1978.

**Internal Review:** The Commission has reviewed the proposed changes and has determined that such changes are necessary. These requirements conform to the Commission's ongoing need for efficient information collection, communication, and management within the energy industry, in light of technological advancements in electric generation.

Interested persons may obtain information on the reporting requirements by contacting the Federal Energy Regulatory Commission, 888 First Street, NE, Washington, DC

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<sup>64</sup> The FERC Form No. 556 is not being revised, but respondents with fuel cell systems with integrated natural gas reformation equipment who are self-certifying or requesting Commission certification as a cogenerator will use the FERC Form No. 556. On page 8, item 6a of the FERC Form No. 556, those respondents should indicate "Fossil fuel, natural gas (not waste)."

20426 [Attention: Ellen Brown, Office of the Executive Director], by email to [DataClearance@ferc.gov](mailto:DataClearance@ferc.gov), or by phone (202) 502-8663.

Please send comments concerning the collection of information and the associated burden estimates to: Office of Information and Regulatory Affairs, Office of Management and Budget [Attention: Federal Energy Regulatory Commission Desk Officer]. Due to security concerns, comments should be sent directly to [www.reginfo.gov/public/do/PRAMain](http://www.reginfo.gov/public/do/PRAMain). Comments submitted to OMB should be sent within 30 days of publication of this notice in the Federal Register and should refer to FERC-556 (OMB Control No. 1902-0075).

## **VII. Environmental Analysis**

38. The Commission is required to prepare an Environmental Assessment or an Environmental Impact Statement for any action that may have a significant adverse effect on the human environment.<sup>65</sup> Whether and how the changes adopted here, however, would affect QF development and the environment is speculative.

39. The changes to the PURPA Regulations do not authorize or fund particular generation that may happen to qualify as QFs, nor do they license or issue permits for operation of generation that may happen to qualify as QFs; such generation can be built and operated independent of, i.e., without, QF certification. They do not authorize or prohibit a generator's use of any particular technologies or fuels, nor do they mandate or

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<sup>65</sup> *Regulations Implementing the National Environmental Policy Act*, Order No. 486, 52 FR 47,897 (Dec. 17, 1987), FERC Stats. & Regs. ¶ 30,783 (1987) (cross-referenced at 41 FERC ¶ 61,284).

limit where QFs should or should not be built. They do not exempt QFs from any Federal, state or local environmental, siting, or other similar laws or regulatory requirements. Given these facts any environmental impact analysis of the revisions proposed here would be speculative and not meaningfully inform the Commission or the public of the revisions' impact on QF development or, correspondingly, of any associated potential impacts on the environment; there are, in short, no reasonably foreseeable environmental impacts for the Commission to consider.<sup>66</sup> Moreover, the revisions proposed here would apply only to a limited number of QFs: fuel cell systems with integrated hydrocarbon reformation equipment. Therefore, the Commission will not prepare an environmental document.

### **VIII. Regulatory Flexibility Act**

40. The Regulatory Flexibility Act of 1980 (RFA)<sup>67</sup> generally requires a description and analysis of final rules that will have significant economic impact on a substantial number of small entities. In lieu of preparing a regulatory flexibility analysis, an agency may certify that a proposed rule will not have a significant economic impact on a substantial number of small entities.<sup>68</sup>

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<sup>66</sup> While courts have held that NEPA requires “reasonable forecasting,” an agency is not required “to engage in speculative analysis” or “to do the impractical, if not enough information is available to permit meaningful consideration.” *N. Plains Res. Council v. Surface Transp. Board*, 668 F.3d 1067, 1078 (9th Cir. 2011).

<sup>67</sup> 5 U.S.C. 601-12.

<sup>68</sup> 5 U.S.C. 605(b).

41. The Small Business Administration's (SBA) Office of Size Standards develops the numerical definition of a small business.<sup>69</sup> The SBA size standard for electric utilities is based on the number of employees, including affiliates.<sup>70</sup> Under SBA's current size standards, the threshold for a small entity (including its affiliates) is 250 employees for cogeneration in the NAICS<sup>71</sup> category:

NAICS code 221118 for Other Electric Power Generation

42. This rule directly affects cogeneration facilities, the majority of which the Commission estimates are small businesses. However, the Commission does not expect the revision to affect a substantial number of small entities. This final rule directly affects only certain QFs, i.e., those that are fuel cell systems with integrated steam hydrocarbon reformation equipment; this rule is voluntary. That is, this final rule expands the types of cogenerators that would be eligible to qualify as QFs to include fuel cell systems with integrated steam hydrocarbon reformation equipment, but this final rule does not require fuel cell systems with integrated steam hydrocarbon reformation equipment to file for QF certification. The Commission does not anticipate that the

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<sup>69</sup> 13 CFR 121.101.

<sup>70</sup> SBA Final Rule on "Small Business Size Standards: Utilities," 78 FR 77,343 (Dec. 23, 2013).

<sup>71</sup> The North American Industry Classification System (NAICS) is an industry classification system that Federal statistical agencies use to categorize businesses for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. economy. United States Census Bureau, *North American Industry Classification System*, <https://www.census.gov/eos/www/naics/> (accessed October 4, 2020).

number of affected small entities would be substantial, nor does the Commission expect that any additional reporting burden or cost imposed on QFs, regardless of their status as a small or large business, would be significant.<sup>72</sup> The Commission estimates that annual additional compliance costs on industry (detailed above) will be approximately \$406,700 to comply with these requirements.

43. Accordingly, pursuant to section 605(b) of the RFA, the Commission certifies that this rule will not have a significant economic impact on a substantial number of small entities.

#### **IX. Document Availability**

44. In addition to publishing the full text of this document in the Federal Register, the Commission provides all interested persons an opportunity to view and/or print the contents of this document via the Internet through the Commission's Home Page (<http://www.ferc.gov>). At this time, the Commission has suspended access to the Commission's Public Reference Room due to the President's March 13, 2020 proclamation declaring a National Emergency concerning the Novel Coronavirus Disease (COVID-19).

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<sup>72</sup> The average cost per response is estimated to vary from \$124.50 for self-certifications to \$4,150 for applications for FERC certification. The cost per respondent will vary based on the respondent's number of facilities and related requests for self-certification and applications for Commission certification (with an estimated cost ranging from \$2,490 to \$74,700 per respondent).

45. From the Commission's Home Page on the Internet, this information is available on eLibrary. The full text of this document is available on eLibrary in PDF and Microsoft Word format for viewing, printing, and/or downloading. To access this document in eLibrary, type the docket number excluding the last three digits of this document in the docket number field.

46. User assistance is available for eLibrary and the Commission's website during normal business hours from FERC Online Support at 202-502-6652 (toll free at 1-866-208-3676) or email at [ferconlinesupport@ferc.gov](mailto:ferconlinesupport@ferc.gov), or the Public Reference Room at (202) 502-8371, TTY (202)502-8659. E-mail the Public Reference Room at [public.referenceroom@ferc.gov](mailto:public.referenceroom@ferc.gov).

**X. Effective Date and Congressional Notification**

47. These regulations are effective [**insert date 60 days after the date of publication in the Federal Register**]. The Commission has determined, with the concurrence of the Administrator of the Office of Information and Regulatory Affairs of OMB, that this rule is not a "major rule" as defined in section 351 of the Small Business Regulatory Enforcement Fairness Act of 1996. This final rule is being submitted to the Senate, House, Government Accountability Office, and Small Business Administration.

List of Subjects in 18 CFR Part 292

Electric power plants

Electric utilities

Reporting and recordkeeping requirements

By the Commission. Commissioner Clements is not participating.

( S E A L )

Nathaniel J. Davis, Sr.,  
Deputy Secretary.

In consideration of the foregoing, the Commission proposes to amend Part 292, Chapter I, Title 18, Code of Federal Regulations, as follows:

**SUBCHAPTER K – REGULATIONS UNDER THE PUBLIC UTILITY  
REGULATORY POLICIES ACT OF 1978**

\* \* \* \* \*

**PART 292 – REGULATIONS UNDER SECTIONS 201 AND 210 OF THE PUBLIC  
UTILITY REGULATORY POLICIES ACT OF 1978 WITH REGARD TO  
SMALL POWER PRODUCTION AND COGENERATION**

1. The authority citation for part 292 continues to read as follows:

Authority: 16 U.S.C. 791a-825r, 2601-2645; 31 U.S.C. 9701; 42 U.S.C. 7101-7352.

2. Amend § 292.202(h)

- a. by revising paragraphs (2) and (3); and
- b. by adding paragraph (4).

The revisions and addition read as follows:

**§ 292.202 Definitions.**

\* \* \* \* \*



(h) Useful thermal energy output of a topping-cycle cogeneration facility means the thermal energy:

(1) That is made available to an industrial or commercial process (net of any heat contained in condensate return and/or makeup water);

(2) That is used in a heating application (e.g., space heating, domestic hot water heating);

(3) That is used in a space cooling application (i.e., thermal energy used by an absorption chiller); or

(4) That is used by a fuel cell system with an integrated steam hydrocarbon reformation process for production of fuel for electricity generation.