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(Original Signature of Member)

119TH CONGRESS
2D SESSION

H. R. _____

To require the Secretary of Energy to adopt model standards and best practices to support effective virtual power plant adoption, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Ms. CASTOR of Florida introduced the following bill; which was referred to the Committee on _____

A BILL

To require the Secretary of Energy to adopt model standards and best practices to support effective virtual power plant adoption, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''Optimizing Networks for Distributed Energy Management and New Demand Act'' or the ''ON–DEMAND Act''.

SEC. 2. VIRTUAL POWER PLANT STANDARDIZATION AND SCALABILITY.

(a) IN GENERAL.—Not later than 1 year after the date of enactment of this Act, the Secretary shall convene a series of not less than 4 meetings, including no fewer than 40 participants across a wide range of stakeholders, research institutions, consumer advocacy groups, and other relevant experts, for purposes of developing model standards and best practices in accordance with subsection (c) by—

(1) examining market, technological, and regulatory conditions hindering virtual power plant repeatability and scalability; and

(2) identifying areas where model standards and best practices established and promoted by the Department would—

(A) help reduce costs and other constraints associated with virtual power plant design, piloting, and performance;

(B) improve the customer experience and consumer protection with respect to virtual power plants; and

(C) help regulators, State energy offices and electric utilities measure, model, and identify how virtual power plant projects would lower overall grid costs.

(b) REQUIREMENT.—Under paragraphs (1) and (2) of subsection (a), the Secretary shall examine and identify the following:

(1) The benefits and costs of deploying virtual power plants, including—

(A) impacts to the bulk-power system and local distribution systems;

(B) avoided costs of energy, including deferring and avoiding new transmission and infrastructure upgrades and the associated costs of those upgrades;

(C) providing energy capacity;

(D) ancillary grid services, including providing essential reliability services;

(E) optimizing costs and timelines for transmission and distribution infrastructure;

(F) delivering resilience and outage frequency reduction benefits;

(G) transmission and distribution congestion reduction;

(H) greenhouse gas emissions reduction;

(I) air quality improvements;

(J) financial value delivered to electricity consumers and communities;

(K) reduced operating reserve requirements; and

(L) increased access to lower cost forms of energy generation.

(2) Procurement processes in various virtual power plant frameworks, including in wholesale markets and in the bilateral procurement of third-party virtual power plants or the output of third-party virtual power plants by electric utilities or load-serving entities.

(3) Financial compensation for various services provided to the bulk-power system and local distribution systems by virtual power plants.

(4) The forecasting, measurement, and verification of performance of virtual power plants.

(5) Customer protection, engagement, recruitment, education, and experience with respect to virtual power plants.

(6) Frameworks for the operation and coordination of virtual power plants that address the roles and responsibilities of—

(A) distributed energy resource aggregators;

(B) virtual power plant operators; and

(C) electric utilities.

(7) Grid data access and sharing among virtual power plant operators, electric utilities, regulators, grid operators, State energy offices, and customers.

(8) Privacy and cybersecurity considerations with respect to virtual power plant operation and data sharing among virtual power plant operators, electric utilities, regulators, grid operators, and customers.

(9) Any related issues, as determined by the Secretary.

(c) MODEL STANDARDS AND BEST PRACTICES.—

(1) IN GENERAL.—Based on the findings from the meetings under subsection (a), the Secretary shall, as appropriate, establish, develop, and promote model standards and best practices to support increased adoption of, and increased effectiveness of, virtual power plants.

(2) REQUIREMENT.—The model standards and best practices under paragraph (1) shall aim to help stakeholders—

(A) avoid common virtual power plant design pitfalls;

(B) enhance the security, reliability, and resilience of virtual power plants; and

(C) maximize—

(i) the adoption and operation of virtual power plants; and

(ii) the benefits provided by virtual power plants to the grid and to all electricity consumers where virtual power plants are deployed.

(3) STAKEHOLDER INPUT.—In developing model standards and best practices under paragraph (1), the Secretary shall—

(A) seek significant input from stakeholders, research institutions, National Laboratories, and consumer advocacy groups; and

(B) if the Secretary determines necessary, establish a steering committee composed of individuals with relevant experience and expertise to aid in the development of the model standards and best practices.

(4) EXISTING STANDARDS AND BEST PRACTICES.—In developing model standards and best practices under paragraph (1), the Secretary may, at the discretion of the Secretary, adopt elements of existing standards and best practices developed by industry standards-setting organizations or other entities.

(5) UPDATES.—The Secretary shall periodically review and update the model standards and best practices established under this section to incorporate technological advancements, address emergency challenges, and ensure continued relevance and effectiveness of the model standards and best practices.

(6) PUBLICATION.—The Secretary shall—

(A) publish and widely communicate the model standards and best practices developed under paragraph (1); and

(B) encourage the adoption of those model standards and best practices through stakeholder outreach, education, and technical assistance programs, including through—

(i) the provision of technical assistance under sections 4 and 5; and

(ii) communication with Federal, State, local, Tribal, and private sector standards-setting organizations.

SEC. 3. VIRTUAL POWER PLANT COMMUNICATION PROTOCOLS.

(a) MEETINGS.—Not later than 1 year after the date of enactment of this Act, the Secretary shall convene a series of at least 4 meetings, including at least 40 partici-

pants across a wide range of stakeholders, research institutions, consumer advocacy groups, and other relevant experts, for the purpose of developing model standards and protocols, in accordance with subsection (b), by—

(1) developing an inventory of government and industry protocols and standards relevant to virtual power plant communications, interoperability, and cybersecurity;

(2) examining the protocols and standards identified under paragraph (1) for purposes of—

(A) determining the effectiveness and key deficiencies of those protocols and standards; and

(B) identifying and examining any other relevant considerations, as the Secretary determines appropriate; and

(3) identifying areas where virtual power plant communications, interoperability, and cybersecurity protocols or standards established and promoted by the Department would support—

(A) virtual power plant repeatability, scalability, and cost-effectiveness; and

(B) the consumer experience and consumer protection with respect to virtual power plants.

(b) MODEL STANDARDS AND PROTOCOLS.—

(1) IN GENERAL.—Based on the findings from the meetings under subsection (a), the Secretary shall, in coordination with the Director of the National Institute of Standards and Technology, establish, develop, and promote model standards and protocols for—

(A) effective interoperability, access, and communication between virtual power plants, electric grid systems, distributed energy resources, and other devices, including communications and interactions between distributed energy resource owners, distributed energy resource aggregators, and grid operators, that would benefit from Federal standardization; and

(B) cybersecurity, including cloud security and data privacy measures, unique to virtual power plant performance.

(2) GOALS OF PROTOCOLS AND STANDARDS.—In developing model standards and protocols under paragraph (1), the Secretary shall seek—

(A) to support cost-effective integration of diverse distributed energy resources; and

(B) to empower consumers to connect their distributed energy resources seamlessly and se-

curely for participation in virtual power plant programs.

(3) STAKEHOLDER INPUT.—In developing model standards and protocols under paragraph (1), the Secretary shall—

(A) seek significant input from stakeholders, research institutions, and consumer advocacy groups; and

(B) if the Secretary determines necessary, establish a steering committee composed of individuals with relevant experience and expertise to aid in the development of the model standards and protocols.

(4) REQUIREMENTS.—In carrying out paragraph (1), the Secretary—

(A) shall avoid establishing or promoting model standards or protocols that are—

(i) duplicative of existing standards and protocols that are widely adopted across the industry; or

(ii) overly burdensome; and

(B) may adopt elements of any relevant existing standard and protocol developed by industry standards-setting organizations or other entities to develop the model standards and pro-

tocols under this section if such adoption improves upon any existing model standard or protocol.

(5) UPDATES.—The Secretary, in coordination with the Director of the National Institute of Standards and Technology, shall periodically review and update the model standards and protocols developed under paragraph (1) to incorporate technological advancements, address emerging challenges, and ensure continued relevance and effectiveness.

(6) PUBLICATION.—The Secretary shall—

(A) publish the model standards and protocols developed under paragraph (1); and

(B) encourage the adoption of those model standards and protocols through stakeholder outreach, education, and technical assistance programs, including through—

(i) the provision of technical assistance under sections 4 and 5; and

(ii) communication with Federal, State, local, Tribal, and private sector standards-setting organizations.

SEC. 4. TECHNICAL ASSISTANCE FOR ELECTRIC UTILITIES, ELECTRIC UTILITY REGULATORS, STATE ENERGY OFFICES, AND OTHER STAKEHOLDERS.

(a) ELECTRIC UTILITIES AND LOAD-SERVING ENTITIES.—The Secretary, in consultation with the National Laboratories and using the tools developed under section 7, shall provide technical assistance for electric utilities and load-serving entities in the demonstration, planning, design, deployment, and operation of virtual power plant projects.

(b) ELECTRIC UTILITY REGULATORS.—The Secretary shall provide technical assistance to State regulatory authorities (as defined in section 3 of the Public Utility Regulatory Policies Act of 1978 (16 U.S.C. 2602)), boards of rural electric cooperatives, boards of municipal utilities, State and local energy offices, Tribal energy regulators, State utility consumer advocates, and other similar entities, as determined by the Secretary, to encourage the effective adoption of virtual power plants, including with respect to—

(1) local distribution system planning;

(2) integrated resource planning;

(3) other long-term planning rate cases;

(4) performance-based ratemaking and potential modification of cost-recovery practices that

would enable electric utilities to capitalize certain costs of virtual power plant adoption;

(5) valuation and verification of virtual power plant benefits for the purposes of compensation;

(6) procurement processes;

(7) consumer protections;

(8) cybersecurity and energy security; and

(9) other relevant considerations, as determined by the Secretary.

(c) FORM OF TECHNICAL ASSISTANCE.—Technical assistance provided under subsections (a) and (b) shall—

(1) take the form of direct technical support, including—

(A) supporting the establishment of utility cost recovery methods for virtual power plant-related investments;

(B) improving grid planning processes, such as integrated distribution system planning, to incorporate third-party or utility-owned virtual power plants;

(C) implementing or revising programs to increase deployment of third-party or utility-owned distributed energy resources;

(D) developing distributed energy resource aggregation models and deployment requirements to enable virtual power plants;

(E) supporting virtual power plant operations to proactively address common virtual power point deployment barriers, including increasing access to data, establishing tariff structures that compensate virtual power plants for their full suite of grid benefits, and enabling virtual power plants to derive value across both retail and wholesale market revenue streams; and

(F) assisting eligible entities in the pursuit of financing opportunities, including those offered by the Department; and

(2) integrate—

(A) the standards, best practices, and protocols developed under sections 2 and 3; and

(B) the modeling tools described in section 7.

(d) EDUCATION.—The Secretary shall host workshops, roundtables, information sessions, and other activities to educate stakeholders and policymakers about virtual power plants, including with respect to—

(1) the costs and benefits of virtual power plants and the role of virtual power plants in meeting load growth and other key energy industry challenges;

(2) best practices, standards, and protocols developed under sections 2 and 3;

(3) resources and technical assistance options available for stakeholders provided by the Department and other Federal agencies; and

(4) other relevant considerations, as determined by the Secretary.

SEC. 5. INTEGRATION OF VIRTUAL POWER PLANTS INTO WHOLESALE MARKETS.

(a) IN GENERAL.—The Secretary shall provide technical assistance for Regional Transmission Organizations and Independent System Operators to ensure timely and inclusive integration of virtual power plants into system planning and marketplaces, including through the implementation of relevant orders of the Federal Energy Regulatory Commission, including Order No. 2222, entitled ''Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators'' (86 Fed. Reg. 16511 (June 1, 2021)) (or a successor order).

(b) FORM OF TECHNICAL ASSISTANCE.—Technical assistance under subsection (a) may take the form of—

(1) supporting operational technology, information technology, or other software, hardware, or security upgrades;

(2) augmenting personnel; or

(3) other agency resources and activities that, as determined by the Secretary, may help Regional Transmission Organizations and Independent System Operators address the operational barriers to integrating high volumes of distributed energy resources into the planning and management of the bulk-power system.

(c) RESOLUTION OF IMPLEMENTATION CHALLENGES.—The Secretary shall support Regional Transmission Organizations and Independent System Operators in resolving complex implementation challenges with respect to relevant orders of the Federal Energy Regulatory Commission, including with respect to—

(1) locational requirements for distributed energy resource aggregations;

(2) rules requiring simultaneous participation by a distributed energy resource in retail programs and in wholesale markets through a distributed energy resource aggregator;

(3) rules establishing metering and communications requirements; and

(4) other issues, as determined by the Secretary.

SEC. 6. CONTRACTS AND COOPERATIVE AGREEMENT AUTHORITY.

In the same manner that a private corporation may make a contract within the scope of its authority under its charter, the Secretary may make contracts and cooperative agreements for the United States government and disburse amounts to carry out the activities outlined in this Act.

SEC. 7. NATIONAL LABORATORY FORECASTING AND PLANNING TOOLS.

(a) IN GENERAL.—The Secretary shall direct the appropriate National Laboratories, as determined by the Secretary, to create and expand modeling tools, including forecasting and planning tools, to enable the design, adoption, implementation, integration, expansion, and operation of distributed energy resources and virtual power plants, such as data sets, predictive models, or measurement methods.

(b) REQUIREMENT.—Modeling tools created or expanded under subsection (a) shall aim to support the inte-

gration of distributed energy resources and the adoption of virtual power plants, such as—

(1) by predicting and managing the performance of virtual power plants under different scenarios, including varying renewable energy generation, demand response participation, and market conditions;

(2) by analyzing historical energy data and forecasting future energy demand and supply;

(3) through near- and long-term local distribution system planning;

(4) by facilitating the development and publication of, and access to, hosting capacity maps; and

(5) by identifying virtual power plant cybersecurity vulnerabilities and potential mitigative measures against such vulnerabilities, including partnerships with cloud-based infrastructure.

(c) CONSULTATION AND COLLABORATION.—In carrying out subsection (a), the Secretary shall—

(1) consult with electric utilities, grid operators, and other stakeholders; and

(2) where appropriate, collaborate with those stakeholders to ensure that any modeling tools created or expanded pursuant to subsection (a)—

(A) have the support of stakeholders; and

(B) will be widely utilized.

(d) PUBLICATION.—The Secretary shall publish and make publicly available the modeling tools created and expanded under subsection (a), including through the provisions of technical assistance under sections 4 and 5.

SEC. 8. REPORT TO CONGRESS.

(a) IN GENERAL.—The Secretary, acting through the Assistant Secretary of the Office of Electricity, and in consultation with the Electricity Advisory Committee, shall submit to the appropriate committees of Congress and make publicly available a report detailing the findings of and actions taken by the Secretary to implement this Act, including—

(1) model standards and best practices developed;

(2) meetings, briefings, workshops, roundtables, information sessions, and other activities held;

(3) stakeholders engaged and input received;

(4) stakeholder outreach, education, and technical assistance provided;

(5) entities receiving technical assistance and expert support; and

(6) modeling tools developed.

(b) BRIEFING.—Not later than 90 days after the date on which the Secretary submits a report under subsection

(a), the Secretary shall brief the appropriate committees of Congress on the findings contained in the report.

(c) REDACTION.—The Secretary shall redact portions of the report prepared under subsection (a) as necessary.

SEC. 9. DELEGATION AND INTERPRETATION.

(a) DELEGATION OF AUTHORITY.—Congress delegates to the Secretary the authority, in carrying out this Act, to interpret the provisions of this Act, taking into consideration cost, effectiveness, public health and safety, and other matters relating to supporting effective virtual power plant adoption.

(b) JUDICIAL REVIEW.—A court engaged in judicial review of any provision of this Act, including judicial review under section 706 of title 5, United States Code, shall determine whether the interpretation of the Secretary is based on a permissible construction of this Act.

SEC. 10. DEFINITIONS.

In this Act:

(1) APPROPRIATE COMMITTEES OF CONGRESS.—The term ''appropriate committees of Congress'' means—

(A) the Committee on Energy and Natural Resources of the Senate; and

(B) the Committee on Energy and Commerce of the House of Representatives.

(2) BULK-POWER SYSTEM.—The term ''bulk-power system'' has the meaning given the term in section 215(a) of the Federal Power Act (16 U.S.C. 824o(a)).

(3) DEPARTMENT.—The term ''Department'' means the Department of Energy.

(4) DISTRIBUTED ENERGY RESOURCE.—

(A) IN GENERAL.—The term ''distributed energy resource'' means—

(i) an energy resource that is connected to the local distribution system;

(ii) any subsystem of an energy resource described in clause (i); and

(iii) any energy resource in front of or behind a customer meter.

(B) INCLUSIONS.—The term ''distributed energy resource'' includes, at a minimum—

(i) battery and thermal energy storage;

(ii) distributed renewable generation;

(iii) devices that perform demand response, energy efficiency, or demand flexibility functions;

(iv) electric vehicles;

(v) electric vehicle supply equipment; and

(vi) any other similar energy resource, whether in front of or behind a customer meter.

(5) DISTRIBUTED ENERGY RESOURCE AGGREGATOR.—

(A) IN GENERAL.—The term ''distributed energy resource aggregator'' means a company or organization that controls, monitors, and manages multiple distributed energy resources to ensure their performance in an energy-related transaction.

(B) INCLUSIONS.—The term ''distributed energy resource aggregator'' includes an electric utility, a third-party grid service provider, a load-serving entity, an original equipment manufacturer, and any other stakeholder that proposes to act as a distributed energy resource aggregator.

(6) ELECTRIC UTILITY.—The term ''electric utility'' has the meaning given the term in section 3 of the Federal Power Act (16 U.S.C. 796).

(7) INDEPENDENT SYSTEM OPERATOR.—The term ''Independent System Operator'' has the mean-

ing given the term in section 3 of the Federal Power Act (16 U.S.C. 796).

(8) LOAD-SERVING ENTITY.—The term ''load-serving entity'' has the meaning given the term in section 217(a) of the Federal Power Act (16 U.S.C. 824q(a)).

(9) LOCAL DISTRIBUTION SYSTEM.—The term ''local distribution system'' means any energy infrastructure owned and operated by an electric utility at a voltage of not more than 35 kilovolts.

(10) REGIONAL TRANSMISSION ORGANIZATION.—The term ''Regional Transmission Organization'' has the meaning given the term in section 3 of the Federal Power Act (16 U.S.C. 796).

(11) SECRETARY.—The term ''Secretary'' means the Secretary of Energy acting through the Assistant Secretary of the Office of Electricity.

(12) STAKEHOLDER.—

(A) IN GENERAL.—The term ''stakeholder'' means an entity relevant to virtual power plant performance and policy.

(B) INCLUSIONS.—The term ''stakeholder'' includes a load-serving entity, a third-party grid service provider, an electric utility, an electric utility regulator, a regional grid operator, a dis-

tributed energy resource aggregator, a research organization, an original equipment manufacturer, a standards-setting organization, a large energy user, a group of distributed energy resource hosts or subscribers, a State energy office, and a relevant labor organization.

(13) VIRTUAL POWER PLANT.—The term ''virtual power plant'' means an aggregation of distributed energy resources that can be coordinated together—

(A) to help balance the demand and supply of electricity; or

(B) to provide other grid services to the bulk-power system or a local distribution system.