Summary of Energy Storage RD&D Provisions in American Energy Innovation Act (AEIA)

Resources for the Future, Fall 2020

Important Notes:

- This is a summary of the energy storage portion (sec. 1301) of the American Energy Innovation Act (AEIA). We will call that portion "the Legislation."
- In answering our questionnaire, please use the funding projections in this summary so that the funding scenarios you use are known by the readers of our report/paper and are consistent with those used by the other experts who are answering the same questions.
- The Legislation specifies funding authorizations only for FY2021-FY2025. This summary supplements those authorizations with a few additional assumptions to construct the "with-Legislation" funding scenario that we ask you to base your answers on:
    - The scenario assumes that funding authorizations will translate into actual funding.
    - Because FY2021 is well underway, it is unlikely that the Legislation would still provide substantial FY2021 funding. Consequently, all funding is shifted to one year later than what is stated in the Legislation.
    - It is quite common and expected for funding to continue beyond the initially authorized period. The funding scenario assumes that enacting the Legislation would result in higher funding for ten years (FY2022-FY2031), as specified below.
- For the first five years, the Legislation specifies the authorized funding. We base funding in years 6-10 on the average of the first five years of funding, scaled up with inflation.
- For the scenario in which the Legislation is *not* enacted, we assume FY20 funding continues but grows at inflation rate.
- All dollar values in this summary are in 2024 dollars. We assume annual inflation rate of 1.4%.
- The Legislation described below is a portion of a larger bill. However, this elicitation is just about this portion, not about the larger bill. In answering, please answer about the effects of this portion only.
- The Legislation specifies that all activities prescribed in it are to be the responsibility of the Department of Energy, unless otherwise mentioned.

Summary of the Legislation

The with-Legislation scenario involves projected ten-year total of $2.3 billion dedicated to energy storage research, development, and demonstration activities for FY2022 – FY 2031. This represents an increase of $1.7

billion over the projected corresponding total of $592 million during the same ten years without the Legislation. The Legislation would establish the following:

- **Energy Storage System Research, Development and Deployment Program**
  - Total funding for this program in FY2022-FY2031 would be $1 billion, for an average of $100 million per year
  - Establishes a cross-cutting R&D program at the US Department of Energy (DOE) to focus on multi-faceted cost reduction and extension of energy storage duration for large-scale commercial deployment, with an emphasis on storage serving grid-connected electricity supply needs.
  - This program would focus on storage systems with durations ranging from sub-hourly to seasonal.
  - RD&D areas of this program:
    - Grid-serving storage
    - Distributed storage including building-grid integration
    - Transportation energy storage including vehicle-to-grid integration
    - Cost-effective systems for the reclamation, recycling, and disposal of energy storage materials including lithium, cobalt, nickel, and graphite.
    - Advanced control methods for energy storage systems
    - Pumped hydroelectric systems including new pumping and generating equipment designs and closed-loop systems (including mines and quarries). Goal of 50 percent cost reduction.
  - The energy secretary would be required to develop a 10-year strategic plan to guide the program.
  - The DOE would coordinate with 1 or more National Laboratories to develop testing and evaluation methodologies for:
    - Storage technologies, controls and power electronics
    - Standardized and grid performance testing for energy storage systems
    - Reliability, safety and durability testing under standard and evolving duty cycles
    - Accelerated life testing protocols to predict estimated lifetime metrics

- **Energy Storage Demonstration Grant Pilot Program**
  - Total funding for this program in FY2022-FY2031 would be $1 billion, for an average of $100 million per year
  - Establishes a competitive grant program for the development of pilot energy storage systems. Program objectives include:
    - Improving security of critical infrastructure & emergency response systems
    - Improving reliability of transmission and distribution systems
    - Optimizing transmission operations and power quality to reduce infrastructure replacement/upgrade costs
    - Supplying energy at peak periods of demand
    - Improving and advancing power conversion systems
    - Increasing the feasibility of microgrids
  - Section 1301 requires DOE to enter into agreements to carry out at least five energy storage system demonstration projects, with one specifically focused on long-duration storage, no later than Sept 30th, 2024. Subsequently must enter into agreements to support more, as budget permits.

- **Technical and Planning Assistance and Grant Program**
  - Total funding for this program in FY2022-FY2031 would be $200 million, for an average of $20 million per year.
  - Creates a technical assistance and grant program at DOE to help electric utilities & cooperatives in identifying, evaluating, planning, designing and procuring energy storage systems.
  - Objectives of this program include:
    - Strengthening the reliability & resiliency of energy infrastructure
    - Reducing the cost of energy storage systems
    - Improving the feasibility of microgrids (especially for rural areas)
    - Reducing consumer electricity costs
  - Competitively awards grants to eligible entities to obtain technical and planning assistance from outside experts ($20 million/year).
  - Technical and planning assistance includes many potential activities, such as:
    - Identifying opportunities for energy storage
    - Conducting feasibility studies to assess potential for new or improved energy storage systems
    - Providing assessments of technical and economic characteristics, engineering design assistance
    - Utility interconnection, permitting and siting issues, resource adequacy planning, resilience planning
    - Information dissemination:
      - Tools for the design, assessment, or operation of energy storage
      - Publicly available databases on energy storage installations
      - Best practices for utilities and grid operators
      - State policies for energy storage

- **Energy Storage Materials Recycling Prize Competition**
  - Total funding for this in FY2022-FY2031 would be $100 million, for an average of $10 million per year.
  - Creates a Recycling Prize through DOE to advance the recycling of critical energy storage materials. Critical energy storage materials include lithium, cobalt, nickel, and graphite. The DOE will establish the specific criteria for eligibility and awarding.

- **FERC must set regulations to identify eligibility and process for electricity storage**
  - The Federal Energy Regulatory Commission (FERC) is required to determine regulations "to identify the eligibility of, and process for, electric storage resources." These include regulated rates on electric energy transmission and other services, which affect the cost recovery and compensation for using the grid to store and receive electric energy.

- **Simplification of requirements for using Bureau of Reclamation reservoirs for pumped storage hydropower**

- Amends the Reclamation Project Act of 1939 to provide the Secretary of the Interior with sole authority for the development of pumped storage hydropower projects that exclusively utilize Reclamation reservoirs so that two separate permits from the Bureau of Reclamation (BOR) and FERC are not required. BOR has more than 350 reservoirs.