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March 6, 2018

### MEMORANDUM

**TO: Power Committee**

**FROM: G Charles, J Fazio, S Hirotsu, D Hua, J Ollis and M Starrett**

**SUBJECT: DOE's Request for Information on Expanding Hydropower and Pumped Storage's Contribution to Grid Resiliency and Reliability**

### **BACKGROUND:**

Presenter: Daniel Hua

Summary: In response to a congressional directive, DOE issued an RFI in February 2018 on a techno-economic analysis of pumped storage at two sites with high levels of intermittent renewable energy generation. The RFI also includes other topics ranging from evaluating hydropower and pumped storage's contribution to grid resiliency and reliability, to opportunities, market incentivization and barriers to development of hydropower and pumped storage.

Representatives from DOE and Pacific Northwest National Laboratory requested Council staff to submit response to the RFI. Staff will present a summary of the DOE RFI to the Power Committee, and a proposed timeline for staff to draft a response, for review by the power committee and the full council, and for staff to submit a final version to DOE by the deadline on April 6, 2018.

Relevance: Various topics covered in DOE's RFI complement with the Council's power plan on evaluating hydropower and pumped storage's contribution to power system reliability and adequacy.

Background: For more details of and to download DOE's RFI see <https://www.energy.gov/eere/water/articles/request-information-hydropower-and-grid>

# DOE's Request for Information on *Expanding Hydropower and Pumped Storage's Contribution to Grid Resiliency and Reliability*

Power Committee  
March 13, 2018

G. Charles, J Fazio, S Hirotsu, D. Hua, J Ollis and M Starrett



## Background

- The Department of Energy (DOE) issued a Request for Information (RFI) in February 2018
- The RFI is in response to a congressional directive to DOE in 2017
- Purpose of RFI is to assist DOE to produce a *techno-economic analysis of pumped storage hydropower at two sites with high levels of intermittent renewable energy generation.*



## DOE Schedule

- The Department of Energy (DOE) issued a Request for Information (RFI) in Feb 2018
- DOE and Pacific Northwest National Laboratory representatives requested Council input to RFI
- Deadline for submission to RFI: Apr 6, 2018 (before April Council Meeting)



## Council Staff Schedule

- Current: on going work to draft response
- Week of Mar 19: review of initial draft (*email*) by Power Committee
- Week of Mar 26: further review of revised draft (*email*) by full Council
- Week of Apr 2: final revised draft, final review, and submission to DOE

## RFI: Topic 1

- Techno-Economic Analysis of Pumped Storage Hydropower at Two Sites
  - Defining “*high-levels of intermittent energy generation*”
  - Defining “*proximity to renewable generation*”
  - Site-development threshold analysis

## RFI: Topic 2

- Hydropower Capability, Operational Impacts and Costs
  - No comment (emphasis on plant operations)

## RFI: Topic 3

- **Current Operations Landscape**
  - Market compensation and incentivization of hydropower and pump storage for their contribution to grid resiliency and reliability
  - Evaluation of system-wide benefits of hydropower resources
  - System characteristics in which energy storage has greatest value
  - State and federal energy storage development and policy

## RFI: Topic 4

- **Role and Value of Hydropower in Future Power Systems**
  - Survey of studies on hydropower benefits for meeting future power needs
  - Evaluating benefits of pumped storage on grid operation
  - Modeling tools capturing benefits of pumped storage

## RFI: Topic 5

- **Additional Research Needs**
  - Integrating future hydropower modeling tools with existing power system models
  - Financing development of pumped storage hydropower
  - International modeling expertise