
# An Examination of the Hydropower Licensing and Federal Authorization Process

## WBS # 1.4.1.402

**Hydropower Program**

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**Aaron Levine, Esq.**

National Renewable Energy Laboratory

# Project Overview

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

## Project Summary

The process to acquire a hydropower license and associated approvals for an individual development project is uncertain, impacting the length and cost of project development. **As a result of this uncertainty, policymakers have relied solely on anecdotal information for proposed regulatory reform. In contrast, this project will use scientifically-based quantitative and qualitative analyses along with a "multiple-lines-of-evidence" approach to examining hydropower licensing timelines, causal factors, and the implications of timelines on risk, cost, and deployment.** Each of the tasks discussed below target different facets of this research problem to ensure that we have adequately filled knowledge gaps.

## Project Objective & Impact

The project will address DOE's priority of reducing soft costs, timelines, and risk associated with hydropower development, while enabling a better understanding of the deployment impacts of reducing these costs and associated risks. However, the analysis will not propose any recommendations on pathways to improve the current regulatory process associated with the federal hydropower licensing and authorization process. The project will produce a publicly available dataset on hydropower project development timelines, updated capacity expansion modeling assumptions, and a comprehensive report of the quantitative and qualitative findings (and potentially associated journal articles).

## Project Information

### Project Principal Investigator(s)

Aaron Levine, Esq. (NREL)
Dr. Brenda Pracheil (ORNL)

### WPTO Lead

Tim Welch

### Project Partners/Subs

Oak Ridge National Laboratory
Kearns & West

### Project Duration

- Project Start Date: FY18, Q4
- Project End Date: FY20

# Alignment with the Program



## Hydropower Program Strategic Priorities

Environmental R&D and Hydrologic Systems Science

Big-Data Access and Analysis

Technology R&D for Low-Impact Hydropower Growth

R&D to Support Modernization, Upgrades and Security for Existing Hydropower Fleet

Understand, Enable, and Improve Hydropower's Contributions to Grid Reliability, Resilience, and Integration

# Alignment with the Hydro Program



## Big-Data Access and Analysis

- Help industry to manage large, disparate and dissimilar datasets relevant for performance, operations, costs, maintenance, permitting, and environmental mitigation
- Support comprehensive reviews of historical regulatory process drivers and outcomes
- Identify information-mechanisms that could increase coordination among permitting agencies
- Develop effective methods of communicating process complexities to non-technical stakeholders

The Examination Hydropower Licensing and Federal Authorization Process project aims to provide datasets from multiple sources on hydropower permitting timelines as well as a comprehensive review of historical regulatory drivers and outcomes from timeline data, cost data, qualitative elicitations with hydropower stakeholders, and individual project case studies. Ultimately, this information will be provided to the public and decisionmakers who could use the data to increase coordination between permitting agencies.

# Project Budget



| Lab | FY17 | FY18 | FY19 (Q1 & Q2 Only) | Total Project Budget FY17–FY19 Q1 & Q2 (October 2016 – March 2019) | |
|---|---|---|---|---|---|
| Lab | Costed | Costed | Costed | Total Costed | Total Authorized |
| NREL | [$0K] | [$30K] | [$155K] | [$185K] | [$760K] |
| ORNL | [$0K] | [$6K] | [$151K] | [$157K] | [$778K] |
| **TOTAL** | [$0K] | [$36K] | [$306K] | [$342K] | [$1,538K] |

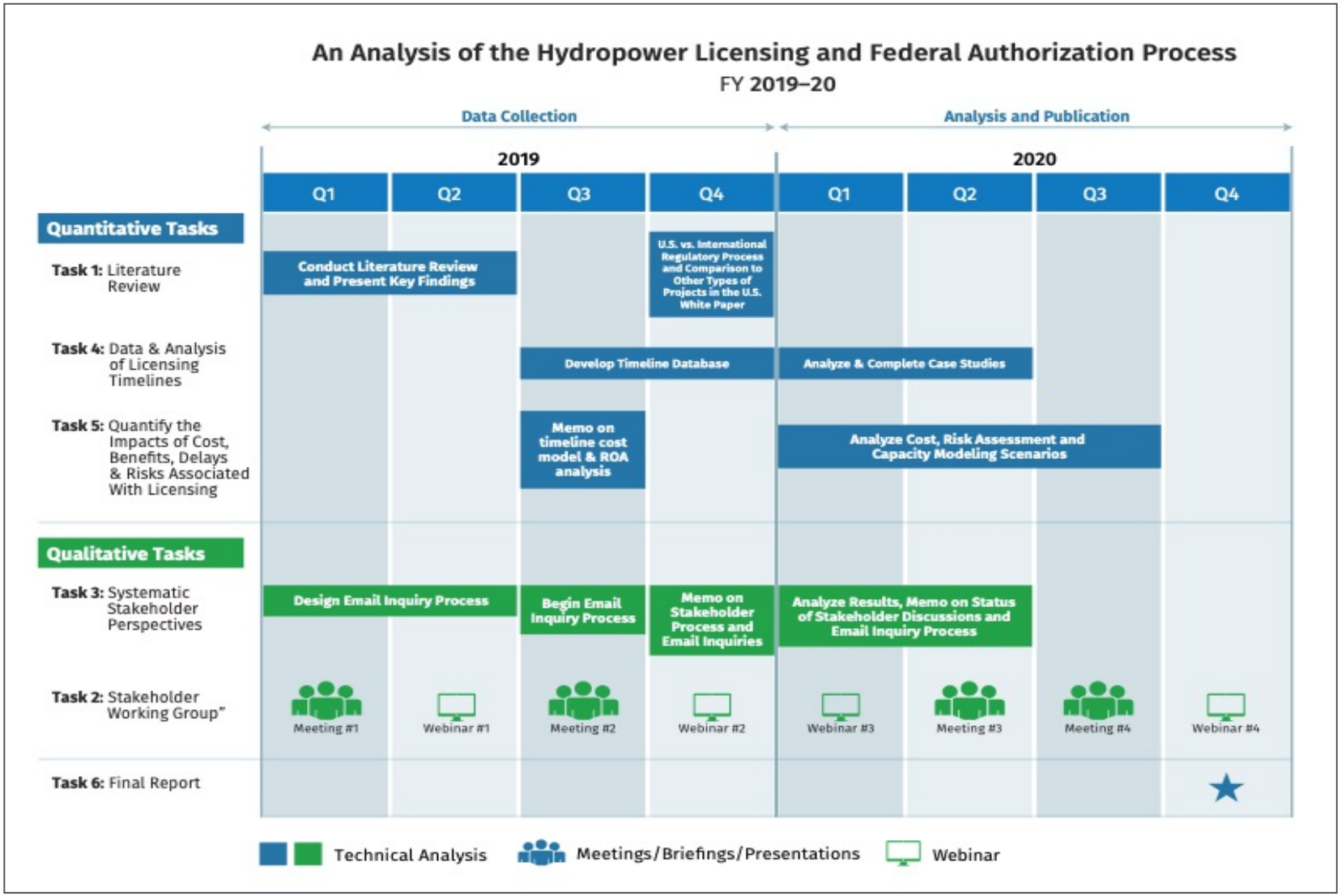
# Management Approach



- Project team: NREL and ORNL, with support from Kearns & West
- NREL - led by Aaron Levine
  - Lead lab; responsible for project coordination
  - Coordinates with ORNL on all formal deliverables to DOE, internal deliverables shared between the labs, subcontracting of Kearns & West, organizing and holding in-person workshops and virtual webinars, and developing a final report
  - Organizes meetings with DOE on behalf of both labs
- ORNL - initially led by Dr. Ryan McManamay; transitioned to Dr. Brenda Pracheil in mid-FY19
  - Splits roles and task responsibilities with NREL
- Kearns & West - led by Anna West and Kelsey Rugani
  - Outreach, logistical, and facilitation support
- Key quarterly milestones benchmark progress
- Two general project phases:
  - FY19: data collection
  - FY20: analysis and publication

# Management Approach

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy



# Technical Approach



- The key issues addressed include the impact of time, cost, risk, and uncertainty of the regulatory process on future hydropower development.
- Our unique "multiple lines of evidence" approach will gather both quantitative and qualitative feedback on these factors.
- Tasks include:
  - Reviewing existing literature and policy, including creating comparative analysis documents for hydropower regulation vs. other types of infrastructure projects and hydropower regulation in the U.S. vs. other countries
  - Developing a timeline database that evaluates the impact of a set of factors associated with each project (e.g., Clean Water Act § 401, Endangered Species Act; inclusion of a settlement agreement, geographic location, project type, etc.)
  - Conducting qualitative email elicitations and follow-up interviews with up to 75 hydropower stakeholders
  - Developing an updated cost model and analyzing updated deployment impacts in NREL's Regional Energy Deployment System (ReEDS) model.

# Technical Approach



## Critical success factors will include:

- The collection of timeline data for a set of 100–150 projects
- Completion of qualitative elicitations with the estimated 75 stakeholders
- Development of a regulatory cost model.

## Challenges to success will include:

- Synthesizing the quantitative and qualitative data
- Completing necessary reviews for publication
- Gaining buy-in from the cross-section of hydropower stakeholders that make up the stakeholder working group (SWG).

# End-User Engagement and Dissemination Strategy



## Project beneficiaries include:

- Federal and state policymakers (Congress, state legislatures, regulatory agency personnel) determining if there is a need for hydropower regulatory reform or streamlining initiatives
- Federal and state regulators (e.g., FERC) seeking to better understand potential regulatory delays associated with hydropower licensing to improve internal processes
- Hydropower community stakeholders (utilities, developers, consultants, trade associations, NGOs) seeking empirical data for a better understanding of project timelines, risk, and costs of hydropower deployment.

# End-User Engagement and Dissemination Strategy



## End-user engagement includes the following:

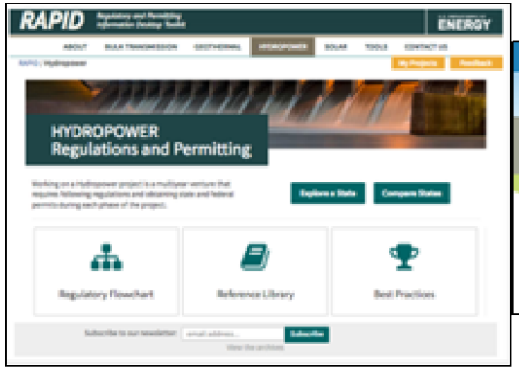
- Preliminary outreach to federal agency and non-federal stakeholders to:
  - Assess proposed tasks and approaches
  - Assess the creation and parameters of a stakeholder working group (SWG)
  - Determine how to communicate project updates and outcomes.
- Selection of an SWG
  - Informs the project and acts as a sounding board on specific tasks, methodology, and review of draft deliverables
  - Includes a cross-section of roughly 25 hydropower community stakeholders.
- Presentations to solicit feedback
  - NHA California Regional Meeting
  - The Northwest Hydroelectric Association Annual Conference (Regulatory Affairs Committee)
  - NHA's Water Power Week in Washington (Regulatory Affairs Committee).

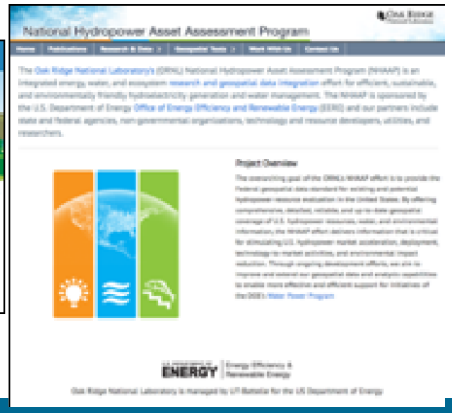
# End-User Engagement and Dissemination Strategy



## At the end of the project, the team will publish and disseminate the following:

- A project factsheet
- A final comprehensive report (and submission of journal manuscripts)
- Conference presentations at HydroVision International in Portland, Oregon, and at Water Power Week in Washington, D.C.
- A project overview video
- Integration of relevant data and findings into the RAPID Toolkit, HydroWise, and HydroSource (formerly NHAAP).



# Progress Since Project Summary Submittal



## Completed tasks since submittal:

- Draft reports comparing hydropower regulation to other infrastructure projects and countries
- Collection of data points for 127 randomly selected FERC-licensed projects post-2000
  - Licensing timeline, compliance timelines for CWA, ESA, NEPA
  - Geographic location, project type, number of facilities, size (MW)
- Qualitative elicitations
  - Three rounds of qualitative elicitations aimed at various hydropower stakeholders, including federal and state agencies, NGOs, tribes, and development interests
- SWG update webinar
  - Preliminary analysis of timeline data
  - Qualitative elicitation summary.

# Future Work



## Future work includes:

- Analysis of timeline data and qualitative elicitation
- Cost modeling and analysis of deployment scenarios
- Development of 15–20 case studies highlighting specific project challenges, efficiencies, and other key aspects
- Draft report and journal manuscripts
- Review of draft report (or subsets thereof) with SWG
- Review of draft report with lab and DOE management.

## Key Challenges:

- Messaging of project findings
- Completion of qualitative elicitations.