Resource Program Enhancement Project

Kick Off Meeting

March 24, 2017

Introductions and Agenda

Time	Mins	Agenda Item	Presenter(s)
9:00 – 9:10	10 mins	Introductions and Agenda Review	Danielle Walker
9:10 – 9:20	10 mins	Background and Overview	Rob Petty
9:20 – 9:50	30 mins	Load Forecast – Overview and Discussion	Reed Davis
9:50 – 10:20	30 mins	Conservation Potential Assessment – Overview and Discussion	Allie Mace
10:20-10:35	15 mins	Demand Response Potential Assessment – Overview and Discussion	Lee Hall
10:35 – 10:45	10 mins	Wellness Break	
10:45 – 11:05	20 mins	Needs Assessment – Overview and Discussion	Ryan Egerdahl
11:05 – 11:25	20 mins	Economic Valuation and Optimization Model – Overview and Discussion	Rob Petty
11:25 – 11:40	15 mins	Timeline and opportunities for public engagement	Danielle Walker
11:40 – 12:00	20 mins	Q&A	All

Background

- BPA began doing its Resource Program after the Act was passed in 1980
- The purpose of RP is to assess BPA's need for power and reserves and then develop a resource strategy for meeting those needs
- BPA did the RP until 1992 after which it relied on its 1995 business plan
- In 2008, after BPA signed 20 year contracts, it restarted the RP process
- Over the past couple of years, BPA has been reviewing its methods for planning and has identified some areas of change which will be discussed today
- The proposed changes should enhance many of its long-term planning activities through augmented information and analysis

Project Scope

- An update to the Resource Program includes the following efforts
  - Change to end use based load forecasting
  - Conducting a BPA conservation potential assessment and distributed energy resources potential assessment
  - Reviewing the Needs Assessment
  - Determining the economic evaluation methodology and tool for resource optimization
- Decisions about resource acquisitions are beyond the scope of the Resource Program as it is not a decision-making process or document. The Resource Program provides information BPA can use to make informed resource acquisition decisions in the future.

Project Goals

- Long Term Goal
  - Develop a sustainable and repeatable process that enhances the analysis of the BPA Resource Program including informing other processes such as
    - Integrated Planning
    - Transmission Planning
    - Power Planning
    - Non-wires Planning

Resource Program Planning Process
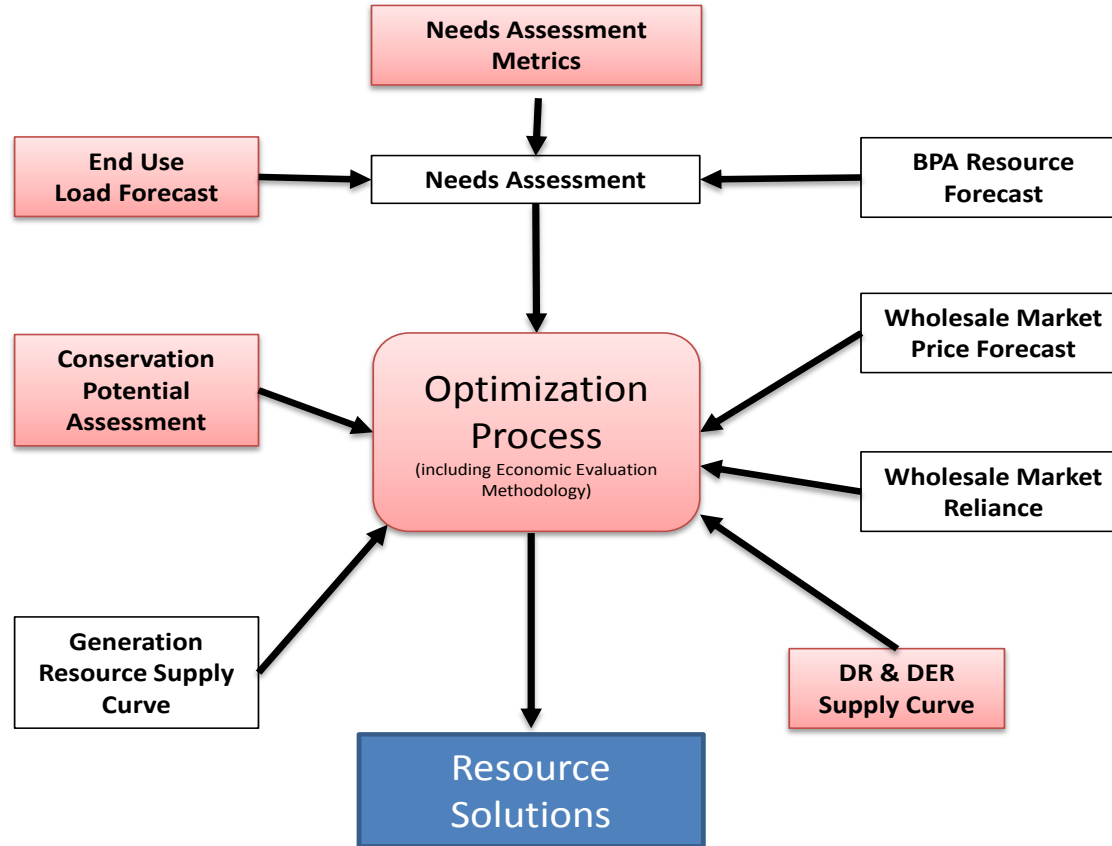
* Indicates a new process

End Use Load Forecast

BPA Load Forecast – Current State

Load Forecasting and Analysis (KSL) is responsible for agency load forecasting and analysis producing forecasts and associated analysis.

- Providing over 1000 energy/peak forecasts (annually)
- Providing a single set of forecasts that are the backbone for consistent transmission and power infrastructure planning and rate cases.
- Forecasts lack transparency to effectively communicate energy efficiency(EE) impacts included in the forecasts. Models are based on historical meter reads already including impacts in trends.

End Use Load Forecast – Future State

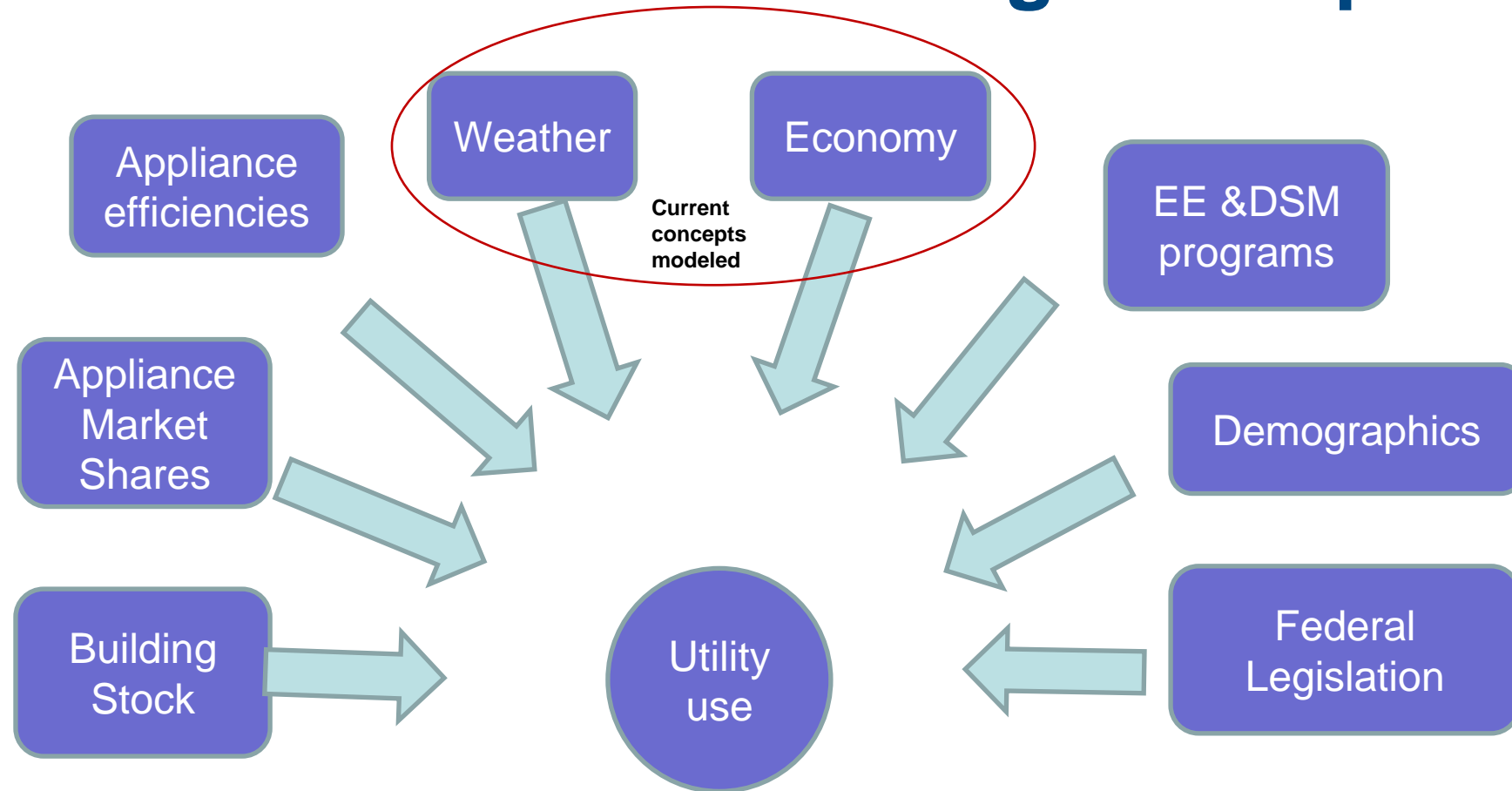Goal:

- An update to the load forecasting process and systems to allow BPA to be transparent and identify the amount of EE and other DSM activities that are in the load forecast

- This would then allow BPA to determine how much additional EE could be used to meet the BPA needs identified in the Needs Assessment

- This process update is consistent with an Action Plan item for the 7th Power Plan

Staff and Funding

- One time software upgrade to add an end-use module to our forecasting tool.
- Increase data needs require additional staff to work with additional market and economic data.
- We anticipate a large work load increase to forecasters doing this type of modeling. Adding 1 new staff member and filling 1 vacant spot to have sufficient staff.

Staffing Needs	Budget	Completion Date
3 new BFTE 1 current BFTE	$500K - $750K $75K Annually	March 2018

SAE Primer – Modeling Concepts

Appliance efficiencies

Weather

Economy

Current concepts modeled

EE &DSM programs

Appliance Market Shares

Demographics

Building Stock

Utility use

Federal Legislation

SAE modeling additions

- Provides means to incorporate many end uses explicitly into process (greater transparency)
- Uses regional data when utility specific data isn't available while calibrating to each utility
- Uses indices of end-uses as independent model driver
- Allows us to expand for future technologies and other impacts on electric consumption

Benefits

- Better transparency of modeling assumptions
- Detail on EE & DSM assumptions & explicitly how they drive model results
- Retains ability to independently collaborate on assumptions with each utility
- Retains scalability ease
- Retains flexibility to use an econometric or SAE option
- Sets up framework to easily incorporate distributed generation in the future

Forecasting Model

Residential Cooling Equipment Stock
  Saturation & Efficiency
  Thermal Efficiency
  Square Footage Trends
  Usage Trends
Commercial Cooling Equipment Stock
  Fuel Share & Intensity
  Floor Space Trends
  Usage Trends

Residential Heating Equipment Stock
  Saturation & Efficiency
  Thermal Efficiency
  Square Footage Trends
  Usage Trends
Commercial Heating Equipment Stock
  Fuel Share & Intensity
  Floor Space Trends
  Usage Trends

Residential Other Equipment Stock
  Saturation & Efficiency
  Usage Trends
Commercial Other Equipment Stock
  Fuel Share & Intensity
  Usage Trends
Industrial
  Economic Trends
  Energy Intensities

Cooling Degree Days

Heating Degree Days

Res XOther +
Com XOther + Ind XOther

Res Cool + Com Cool

Res XHeat +
Com XHeat

$$Energy_m = a + b_c \, x \; XCool_m + b_h \, x \, XHeat_m + b_o \, x \, XOther_m + e_m$$

Public Engagement

- BPA seeks confirmation of additional territory specific information from Regional Dialogue customers to guide this model
  - We will need confirmation that survey results are reasonable for a particular customer, or how they should be adjusted
  - We will need confirmation that model drivers represent each customer
  - We will need summary information on residential, commercial, industrial, and possibly other consumer classes
  - We will look for confirmation of distributed generation activity by customer
- We will continue to gather information we currently do about new load additions or losses
- For a short while this will likely take more of a customer's time

Progress

- Currently reviewing moving ahead with software changes, working on requirements and having preliminary discussion with the vendor
- Currently reviewing moving ahead with hiring activity and starting internal paperwork for this process
- Reviewing detailed data from available surveys to get market specifics as close to customer level as possible
- Exploring alternatives to provide model drivers (economic and other data)
- Developing internal training plan

Timeline

Task	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
Gather IT project requirements			complete														
Executive approval			complete														
IT project structure set up				▓													
Arrange for work with Itron				▓													
Contracting Process				▓	▓												
ITRON begins work						▓	▓	▓	▓	▓	▓	▓					
Staffing process						▓	▓	▓									
Gather end-use data by class of service									▓	▓	▓	▓					
Gather customer sales by service class							▓	▓	▓	▓							
Testing of ITRON work												▓	▓				
Integrate new IT work with BPA systems									▓	▓	▓	▓					
Training forecasting staff on end use method								▓	▓								
Work with customers on end-use forecast												▓	▓	▓			
Review forecasts														▓	▓		
Distribute forecasts for use within Agency																▓	▓

BPA Conservation Potential Assessment

CPA Current State

- BPA relies on the Council's Power Plan for its assessment of conservation potential
- Council's CPA is region-wide and savings potential is only reported in total
- BPA uses a proxy of 42% of the total regional potential roughly based on BPA share of regional sales
- Benefits of current state:
  - BPA is able to leverage the Council's expertise
  - Saves staff time and funding
- Issues with current state:
  - Does not provide location specific information on conservation potential
  - Unknown if sales proxy is representative of savings potential in BPA territory

CPA Future State

- Goal:
  - Calculate the energy efficiency savings potential and costs in BPA service territory
  - Provide locational information on EE potential within the region
- Results of assessment
  - Will be provided to the Resource Program optimization model
  - Can be used for integrated demand side management efforts, transmission planning and non-wires planning
  - Can support program initiatives and market strategies

CPA Plan

- Determine the amount of technical and achievable savings potential for BPA served load
  - Economic potential will be assessed in the Optimization Model process
- Calculate total savings, not utility specific
- Leverage available data and information (e.g Council supply curves, Residential and Commercial Building Stock Assessment)
- Apply same considerations used in Seventh Power Plan:
  - Alignment of baselines, treatment of codes and standards
  - Technologies and costs

Staff and Funding

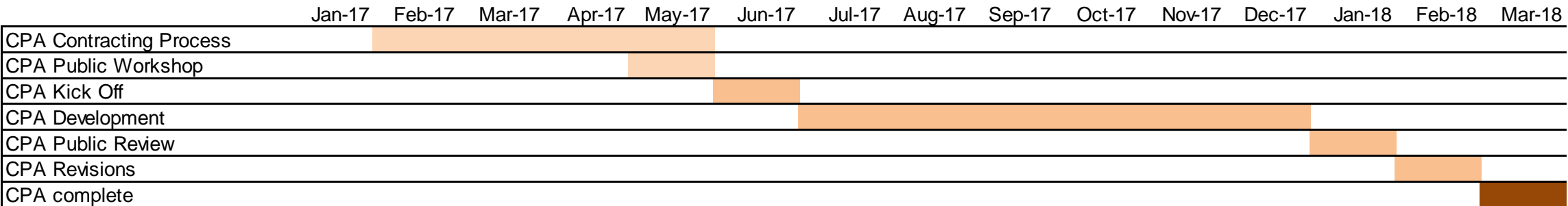- No additional staff needed
- Cost estimates are highly variable and will be better known when contract proposals are received
- Costs are already budgeted for

Staffing Needs	Budget	Completion Date
.5 Reallocated FTE	TBD	March 2018

CPA Progress

- Draft scope of work developed

- Working with supply chain to develop RFP

- Goal of April-early May release of RFP

Timeline

	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
CPA Contracting Process															
CPA Public Workshop															
CPA Kick Off															
CPA Development															
CPA Public Review															
CPA Revisions															
CPA complete															

Distributed Energy Resources Potential Assessment

DER Potential Assessment – Current State

- BPA currently has limited information regarding Demand Response (DR) or Distributed Energy Resource (DER) potential in the loads served with power supplied by BPA under Regional Dialogue contracts

- It would be useful for BPA Power and Transmission Planning to have information on the potential of different types of DR/DER, how quickly it could be developed, and where it is located.

- The 7th Power Plan recommends that BPA complete a DR potential assessment in 2017, to be used in the Council's mid-term review of the 7th Plan during 2018

- The 7th Plan also recommends that BPA assess the barriers to developing DR in the loads served with BPA power

- This second assessment would also inform the mid-term Council Plan review during 2018

DER Potential Assessment – Future State

- Goal: BPA has a set of utility-vetted DR/DER supply and cost curves for different DR/DER products and an improved locational understanding of where DR/DER might be available

- This improved information is being routinely and regularly used for near-term and long-term BPA Power and Transmission Planning
  - This will fulfill the BPA Integrated Demand Side Planning vision.

- This information will support BPA 2017-2022 Strategic Priorities, and contribute to the BPA Power Services Strategic Direction, 2017-2022, goal of "Advancing Demand Side Management"

- This information addresses the Power Council's 7th Plan Action Plan items REG-3, BPA-3, and BPA-7

DER Potential Assessment Details

The Potential Assessment : Study how much DR potential exists in the loads served with power supplied by BPA under Regional Dialogue contracts under different sets of assumptions, what types of end use loads are most available for DR, where the potential DR is generally located, how rapidly it could be developed, and the estimated cost to develop the DR.

The Barriers Assessment : Identify the barriers to developing DR in the loads served with power supplied by BPA under Regional Dialogue contracts. This assessment will identify market, legal, operational, economic, contractual, motivational, institutional, and political barriers to the consideration and use of DR by BPA and/or its Power customer utilities.

Staff and Funding

- BPA Project Staff:
  - Lee Hall, Sponsor
  - Frank Brown, Project Manager
  - Melanie Smith, Contracting Officer's Technical Representative
  - Jean Paul Bretz, Contracting Officer

No additional staff needed

Costs are accounted for in the existing Power Services budget

Staffing Needs	Budget	Completion Date
.5 Reallocated FTE	$600,000.00	Nov 29th, 2017

Progress

- An RFP was issued on February 13, 2017. Three consulting firms submitted technical proposals on or before the March 10th, 2017 deadline. The technical proposals are being evaluated now by a technical evaluation team which intends to submit their recommendation to the Contracting Officer by the end of March 2017.

Timeline

	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17
Kick off meeting with Contractor		▒							
Work Plans Due (Stage Gate 1)			▒						
Initial (Rough, Partial) Draft Assessments				▒					
Final Draft Assessments					▒	▒	▒		
Final Assessments Due								▒	▒

Wellness Break

BPA Needs Assessment

BPA Needs Assessment – Current State

- Produce forecasts for two years within a 10 year planning horizon

- Use five metrics to measure the ability of BPA to meet obligations

  - Annual energy

  - Monthly 10th percentile (P10) heavy load hour energy

  - Monthly P10 superpeak energy

  - 18-hour capacity

  - Balancing reserves

- Analyze each metric under an "expected case" forecast, while the annual energy metric is also analyzed under high and low load growth scenarios

- Also produce ad hoc scenarios as needed (e.g. product switching)

BPA Needs Assessment – Future State

- Goal: Meet the capacity and energy forecast requirements of the Resource Program using an efficient process that maintains reasonable run times

- Produce forecasts to meet a 20 year planning horizon

- Expanding the study years under the current process creates workload and run time issues, particularly regarding the 18-hour capacity metric

- Consequently, it is possible that changes will need to be made to one or more of the current metrics

Needs Assessment

- Alternative metrics are currently being discussed and tested, particularly for capacity, to meet the needs of the Resource Program and other potential users

- Whether and how to move forward with different metrics should be concluded by April 2017

- This potential change should not impact the timing of the next Resource Program

Staff and Funding

- The changes currently under consideration are not anticipated to require new staff or additional budget

Staffing Needs	Budget	Completion Date
No new staff needed	No additional budget needed	July 2018

Timeline

	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18
Needs Assessment methodology/metrics						■	■	■									
Needs Assessment input data developed													■	■	■		
Needs Assessment complete																■	■

Economic Evaluation Methodology & Optimization Model

Current & Future State

- BPA does not currently use a resource optimization tool for evaluating different resource portfolios in its Resource Program

- Goal: Develop a transparent and well understood methodology and tool that can be used to compare and evaluate different resource portfolios for meeting Bonneville needs
  - To achieve this, BPA intends to develop or acquire a resource optimization model
  - BPA will also need to develop the criteria to use in its evaluation process

Optimization Model Options

- Options include
  - AURORA
  - Navigant's Portfolio Model
  - Hiring a consultant
- BPA is proceeding down the path of exploring the use of AURORA for evaluating resource portfolios
  - BPA has extensive experience with AURORA and uses it in its rate cases and its Long-term Reference Case
  - BPA plans to test AURORA during the spring and summer of 2017
- In conjunction with the model development, BPA will also determine the economic criteria to be used

Staff and Funding

- Bonneville currently has the AURORA model so no additional IT funding is expected
- It is expected that incremental staff time will be required but no additional staffing is expected beyond what is already allocated

Staffing Needs	Budget	Completion Date
1 current BFTE 1 – 1.5 reallocated BFTE	$0 - $150K	October 2018

Timeline

	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19
Testing AURORA	███																							
Enhance AURORA's Capabilities	██████																							
Model Testing				████																				
Run Model with Inputs																	████							
Model Review and Input																					███			
Model Revisions and Final Output																							███	
Determine Economic Approach					█████████																			
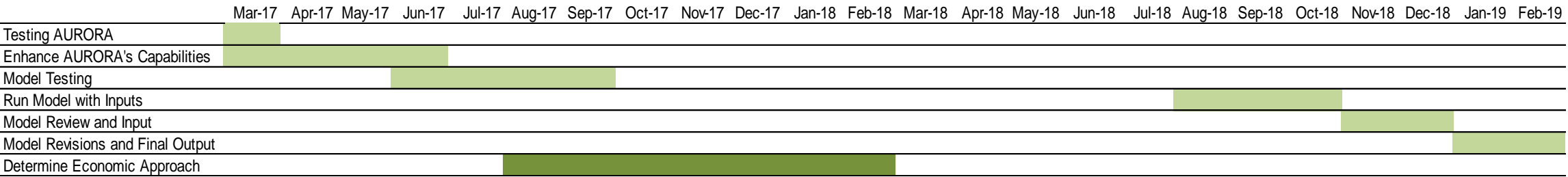
Project Timeline

Estimated Project Timeline

BPA Fiscal Year	Q2 2017	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Q1 2019	Q2 2019	Q3 2019
End Use Load Forecast	███	███	███	███	███					
Conservation Potential Assessment	███	███	███	███	███					
DR Potential Assessment	███	███	███	███						
Needs Assessment			███		███	███				
Optimization Model			███	███				███	███	███
Economic Evaluation			███	███	███					
IPR Process (tentative)						███				███
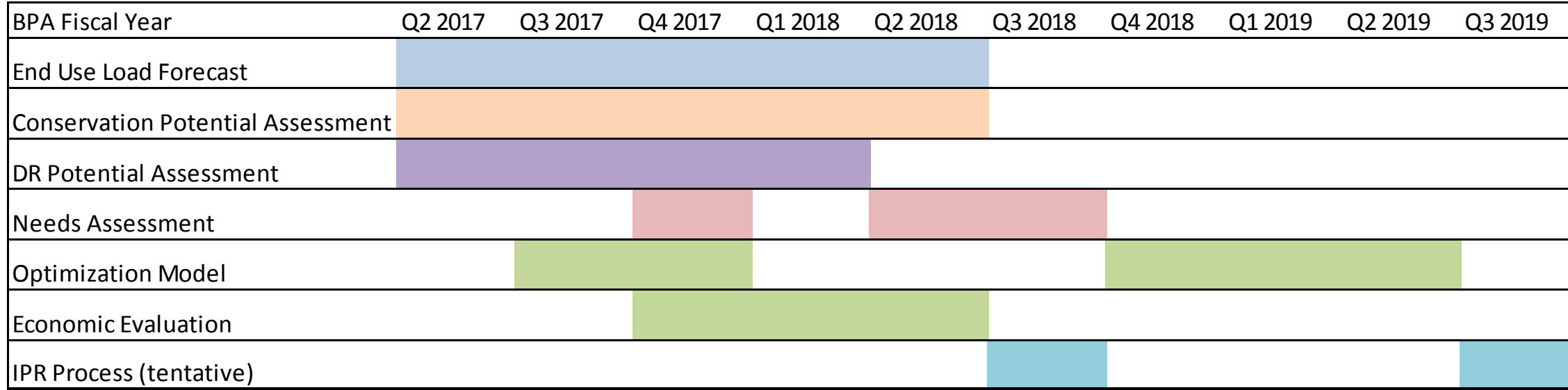
- Timeline is optimistic and still contingent on progress with load forecast development
- It is not currently expected that the analysis and results will be completed by the 2018 IPR

Public Engagement

Public Engagement Process

- Workshops on project initiatives
  - Share progress and draft results
  - Technical discussions
  - Collect feedback and answer questions
- Current workshops:
  - End Use Load Forecast workshop – May 10th
  - CPA Workshop – May 18th
  - Needs Assessment and Optimization Model – Fall 2017
- Will engage in 2nd round of workshops when draft results are developed
- Updates through communications and on website throughout process

Discussion
Q&A