CITY OF VERNON 2018 POWER IRP

VPU INTEGRATED RESOURCES PLAN UPDATE MEETING
MARCH 29, 2018
TODAY’S AGENDA

- IRP TEAM INTRODUCTION
- 2018 INTEGRATED RESOURCE PLAN UPDATE
- 2018 ELECTRIC COST OF SERVICE STUDY INTRODUCTION
- PRELIMINARY SURVEY RESULTS
- NEXT STEPS
- IRP RESOURCES
- QUESTIONS/DISCUSSION

March 29, 2018
IRP TEAM

VERNON PUBLIC UTILITIES
- Overall IRP Responsibility
- Management of Consultants

ABB
- Prime IRP Consultant
- IRP Development and Analysis

JOULE MEGAMORPHOSIS
- IRP Support Sub-Contractor
- IRP Public Process

March 29, 2018
Presentations:

- 2018 Integrated Resource Plan Update
  - by Benson Joe, Prime IRP Consultant

- 2018 Electric Cost of Service Study Introduction
  - by Abraham Alemu, Integrated Resources Manager
CUSTOMER PLANS

Preliminary survey results as of March 22, 2018
INTEGRATED RESOURCE PLAN

Background information is provided in this section for assistance.

Preliminary survey results as of March 22, 2018.
ENERGY MIX

VPU Energy Resources 2017

- Natural Gas: 59%
- Renewable Energy: 29%
- Large Hydroelectric (Hoover): 2%
- Biomethane & Landfill Gas: 9%
- Solar: 12%
- Other: 8%
- Generic (Unspecified) Short-Term Purchases: 1%
- Nuclear (Palo Verde): 9%

March 29, 2018
CUSTOMER SERVICE

Preliminary survey results as of March 22, 2018
VERNON NOTIFICATION SYSTEM

Login to your account

Username

Password

Don't have an account? Sign up

www.cityofvernon.org/everbridge

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March 29, 2018
Average Commercial Rates - 1/2017
(Cents/kWh, Measured at 3500 kWh / Month)

COMMERCIAL ELECTRIC RATES
Average Industrial Rates 1/2017
(Cents/kWh, 2,000 kW Load, 65% Load Factor)

Industrials Electric Rates
Typical Outage Causes in Vernon by Type

- Vehicle: 8%
- Supply to City: 0%
- Overhead Equipment: 10%
- Underground Equipment: 5%
- Weather: 26%
- Metallic Balloon: 28%
- Trees: 0%
- Animal: 13%
- Unknown: 8%
- Other: 2%
- Human: 0%

Vernon Public Utilities was awarded Diamond Level Reliable Public Power Provider by the American Public Power Association for 2016 - 2019

System Average Outage Indices
SCHEDULE: NEXT STEPS

- PUBLIC MEETING 1: February 14, 2018
  INTRODUCTION/ SURVEY

- PUBLIC MEETING 2: March 29, 2018
  PRESENT PRELIMINARY ANALYSIS

- SURVEY EXTENDED - CLOSES APRIL 8, 2018

- PUBLIC MEETING 3: Late April (TBD)
  GATHER/DISCUSS COMMENTS ON DRAFT IRP

- PUBLIC MEETING 4: TBD
  PRESENT FINAL IRP TO CITY COUNCIL
RESO URC ES FOR STAKEHO LDERS
QUESTIONS OR COMMENTS?

THANK YOU FOR YOUR PARTICIPATION AND SUPPORT!
2018 Integrated Resource Plan Update

Vernon Public Utilities

Benson Joe (ABB)
Leesa Nayudu (Joule Megamorphosis)
Global Industry Trends and New Challenges

The electric power industry is changing right before our eyes

- Climate Change
- Low Gas Prices
- Regulatory Uncertainty
- Distributed Generation

- Renewable Generation
- Competitive Energy Markets
- DER: Demand Response, PV, ES
- Transactive Energy
- Fuel Mix Migration
- Microgrids
- Distributed Generation
Senate Bill 350 (SB 350)

Why is VPU performing an Integrated Resource Plan (IRP)?

- Establishes California’s 40% GHG reduction goal from 1990 levels by 2030
- Longer term goal of 80% reduction by 2050
- Increases Renewable Portfolio Standard (RPS) from 33% in 2020 to 50% by 2030
- Requires publically owned utilities (POUs) (> 700 GWh) to file an IRP

The resource plan will help to identify future risks and near term action plans
IRP Customer Surveys
Your feedback matters!!!!

Feedback from Customers
– Your input helps VPU plan for future infrastructure
  • Distributed solar
  • Energy storage
  • Electric vehicle chargers
  • Energy efficiency
  • Demand Response
  • Microgrids
– VPU needs to procure power accordingly
  • Helps us produce more accurate load forecast
  • DR and EE may needed to help meet long term GHG goals

Adds Load
– Business expansion
– New customers
– Electric Vehicles
– Battery Storage (Charging)

Subtracts Load
– Distributed Solar
– Community Solar
– Energy Efficiency
– Demand Response
– Battery Storage (Discharging)
## Existing Resources

Where does your power come from today?

<table>
<thead>
<tr>
<th>Contract Name:</th>
<th>Type</th>
<th>Capacity (MW) Under Contract:</th>
<th>Contract Start Date</th>
<th>Contract Expiration Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malburg Generating Station</td>
<td>Natural Gas</td>
<td>134 MW</td>
<td>1/ 1/ 2005</td>
<td>12/ 31/ 2028</td>
</tr>
<tr>
<td>Palo Verde</td>
<td>Nuclear</td>
<td>11.59 MW</td>
<td>4/ 1/ 1986</td>
<td>12/ 31/ 2030</td>
</tr>
<tr>
<td>Hoover Power Plant</td>
<td>Hydro</td>
<td>22 MW</td>
<td>8/ 1/ 1987</td>
<td>12/ 31/ 2067</td>
</tr>
<tr>
<td>Antelope DSR (Solar Photovoltaic)</td>
<td>Solar</td>
<td>25 MW</td>
<td>1/ 1/ 2017</td>
<td>12/ 31/ 2036</td>
</tr>
<tr>
<td>Puente Hills (Landfill Gas)</td>
<td>Landfill Gas</td>
<td>10 MW</td>
<td>1/ 1/ 2017</td>
<td>12/ 31/ 2030</td>
</tr>
</tbody>
</table>

Resources are not owned by VPU, but contracted via power purchase agreements (PPAs) with third party developers.
44% of the power mix will come from natural gas in 2018

32% of the power mix will come from renewable energy in 2018

Long term PPAs for nuclear and hydro power

Two new utility solar contracts started in 2017
- Astoria (20 MW)
- Antelope (25 MW)

Clean energy resources will be a major part of the future resource mix
GHG Reduction Goals

VPU will be assigned a share of the total California GHG targets in 2030

VPU will likely need to reduce GHG emissions by 41% between now and 2030

Source: California Air Resources Board
What type of resources are being evaluated?

- Utility Scale Solar
- Wind
- Geothermal
- Biomass
- Natural Gas
- Battery Storage
- Energy Efficiency
- Demand Response
- Distributed Generation

VPU may need to look at replacement options for the Malburg Generating Station when the PPA expires in 2028.
What factors impact your power rates?

### Natural Gas & GHG Emission Costs
- Natural gas and GHG emission allowance prices are expected to increase
- VPU will become less reliant on natural gas

### Transmission Costs
- VPU has to pay to use the high voltage transmission system managed by the CAISO

### Renewable Energy
- VPU will need to procure more renewable energy to meet the RPS
- Solar prices are expected to decrease over time

### Battery Energy Storage
- Energy storage technology costs could decrease by 50% by 2030
- Energy storage helps with over-generation and renewable integration

VPU is continually monitoring market changes when evaluating long term resource decisions
Future Resource Mix (DRAFT)

How will the resource plan look in the future?

- The RPS will increase from 34% in 2018 to 61% by 2030
- 20 MW of battery storage for renewable integration by 2030
- Natural gas capacity is still required for reliability, but generation from natural gas is greatly reduced
- Flexible capacity requirements increase from 45 MW to 152 MW with more renewables

<table>
<thead>
<tr>
<th>Resource Plan</th>
<th>Units</th>
<th>2018</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar</td>
<td>MW</td>
<td>45</td>
<td>169</td>
</tr>
<tr>
<td>Wind</td>
<td>MW</td>
<td>0</td>
<td>65</td>
</tr>
<tr>
<td>Battery Storage</td>
<td>MW</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Demand Response</td>
<td>MW</td>
<td>2</td>
<td>39</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>MW</td>
<td>134</td>
<td>134</td>
</tr>
<tr>
<td>Flexible Capacity Requirements</td>
<td>MW</td>
<td>45</td>
<td>152</td>
</tr>
<tr>
<td>RPS</td>
<td>%</td>
<td>34%</td>
<td>61%</td>
</tr>
<tr>
<td>GHG Emission</td>
<td>Metric Tons</td>
<td>394,909</td>
<td>209,000</td>
</tr>
</tbody>
</table>

VPU meets the current 2030 GHG emission goal under this preliminary plan
Resource Planning Challenges

2030 VPU Net Load
Future Resource Mix

Renewable Energy Increases as Natural Gas Generation Decreases

VPU is planning for a more sustainable resource mix at the lowest cost possible

Note: RPS % and Generation mix % have slightly different calculations due to accounting of renewable energy credits (RECs)
IRP Timeline

- Collect feedback from customers to understand what is most important to you
- Incorporate feedback into long term load forecast and resource gap analysis
- Evaluate supply side and demand side options
  - Solar, energy storage, distributed generation, energy efficiency, demand response
- Present several different portfolio options for future meetings
  - Least Cost Resource Plan (50% RPS only)
  - Sustainability Focused Resource Plan (50% RPS + 40% GHG Reduction)
- Identify near term action plan to meet long range goals
- Submit IRP data to CEC as part of statewide planning process
- Review recommendations from CEC/CPUC/CARB

Your feedback will help us better plan the power system and maintain lower rates
March 29, 2018

Electric Cost of Service Introduction

Vernon Public Utilities
Agenda

• Cost of Service and Rate Setting Process
• Market Issues and Rate Trends
• Vernon Rate Design Strategy and Philosophy
• Initial Study Results – System Average Revenue Requirement
• Next Steps
Introduction

What is a Cost of Service and Rate Study?

• Industry process that determines the costs incurred by a utility to provide service to customers

• Calculates the costs related to each customer class (e.g., residential, commercial), that must be recovered through rates
Why Now?

*Why are we doing a Cost of Service and Rate Study?*

- Best practice to complete a COS study every 3 to 5 years
- Typically, **updates needed when:**
  - *Current revenues don’t adequately recover costs*
  - Significant change in expected expenses (e.g., new debt issued, increased regulatory costs, or capital needs)
  - *Change in system loads or energy sales (e.g., new customer class)*
  - *Potential changes to power generation costs or plans (e.g., VPU’s IRP)*
  - Application of new technologies (e.g., AMI or EVs)
  - Other significant market changes or drivers
VPU COS and Rate Study Process

Financial Forecast (5-yrs)
- Forecast financial performance and needs for VPU over a five-year period

Revenue Requirement
- Total costs of providing utility services to customers in various rate classes to be recovered through rate revenue

Cost of Service
- Allocates the revenue requirement to each customer class (e.g., the costs from each customer class to be recovered in rates)

Rate Design and Recommendations
- Develop charges and pricing signals that convey the COS to customers and fully recover costs.
Market Issues and Rate Trends

- Nationally: electric sales are stagnant / California: many utilities projecting declining sales
- Distributed energy resources
- Costs incurred are misaligned with rates:
  - Utility costs are largely fixed; however, rate revenues are largely variable
- Increased regulatory and renewable costs
Market Issues and Rate Trends

- Electric Vehicles
- Role of technology and smart meters
- Changing system load profiles - California ISO Duck Curve
- Increasing customer interaction and data needs
Rate Strategy:

Combines VPU’s financial objectives and rate design philosophy while guiding long-term cost of service and rate making decisions.
Vernon Rate Strategy – Key Elements

• Ensure financial stability and integrity
  – Ensure stable performance, strong bond ratings
• Fairness and equity in rates
  – Align rates with COS results, eliminate subsidization where possible
• Renewables and Conservation
  – Compliance; support where directed and properly recover fixed and variable costs
• Maintain competitiveness and valuable services
• Engage stakeholders in process
Initial Study Results –
System Average Revenue Requirement

• In early years of the 5-year Test Year, Base Rate Revenues are under Revenue Requirement
  – Pending update of budgets and IRP cost and load forecast
  – There will be no rate increase for the upcoming fiscal year as studies will not be completed in time by budget approval
  – Indication is that a 2% annual rate increase would have been needed to meet the next year’s revenue requirement
  – City will use reserves to meet revenue requirement and make it up in the following years
  – Future rate increase will be based on the recommendations of the IRP and COS/Rate Design studies

• Management of VPU’s reserves, capital plan, and sources of other income can smooth variability in cost over/under recovery
Next Steps

• **Finalize Revenue Requirement** and identify if VPU is adequately recovering costs for the five-year forecast period, including expected IRP costs

• **Calculate the cost of service** for each customer class to guide and inform rate recommendations

• **Design rates for each customer class** to properly recover total costs and align with cost of service outcome