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Targeted Energy Efficiency

Lessons Learned Assessing EE as an NWA

August 21, 2019

Agenda

Tri-Cities Project Overview

Key Considerations

Results

Lessons Learned

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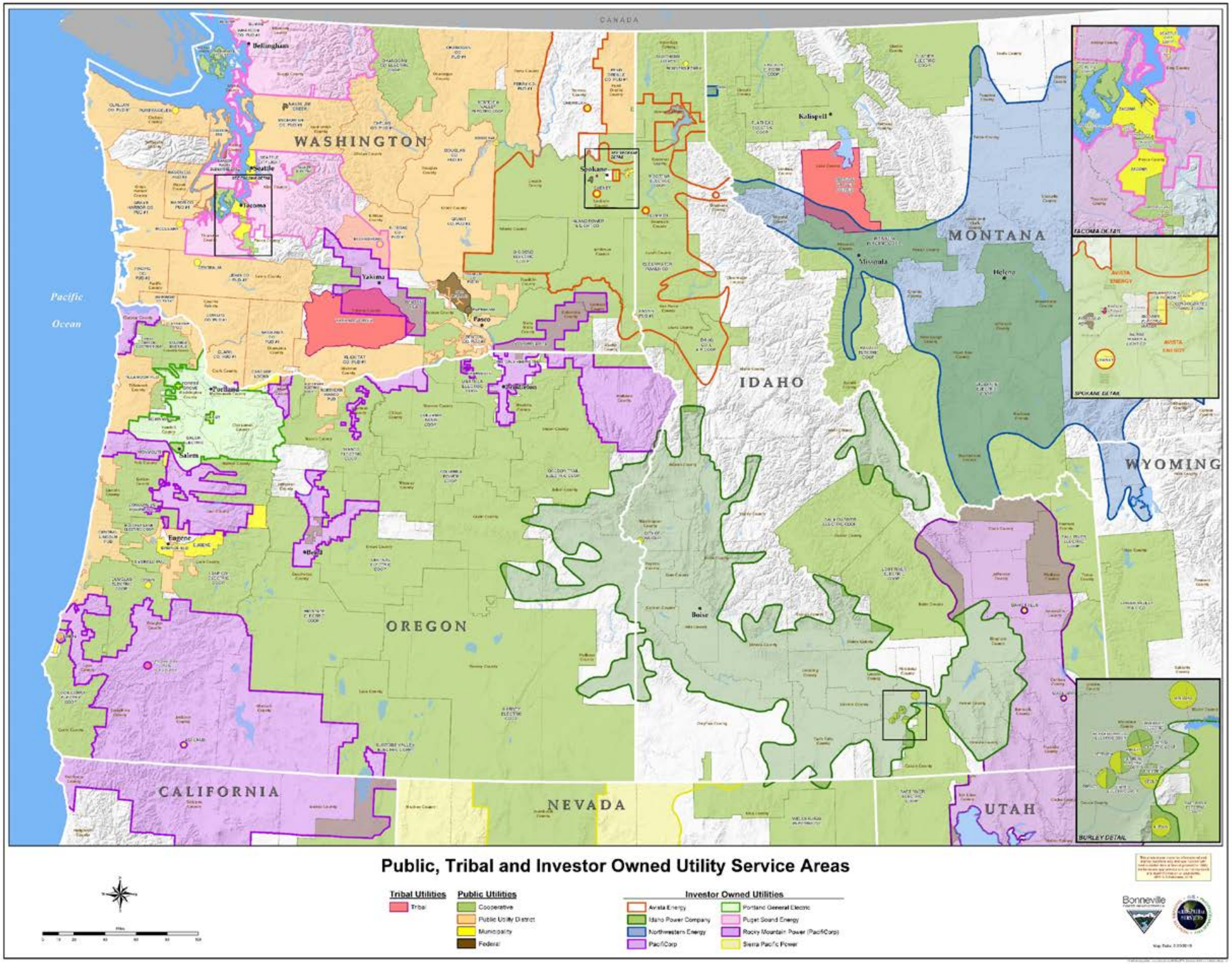
Introduction



Public, Tribal and Investor Owned Utility Service Areas

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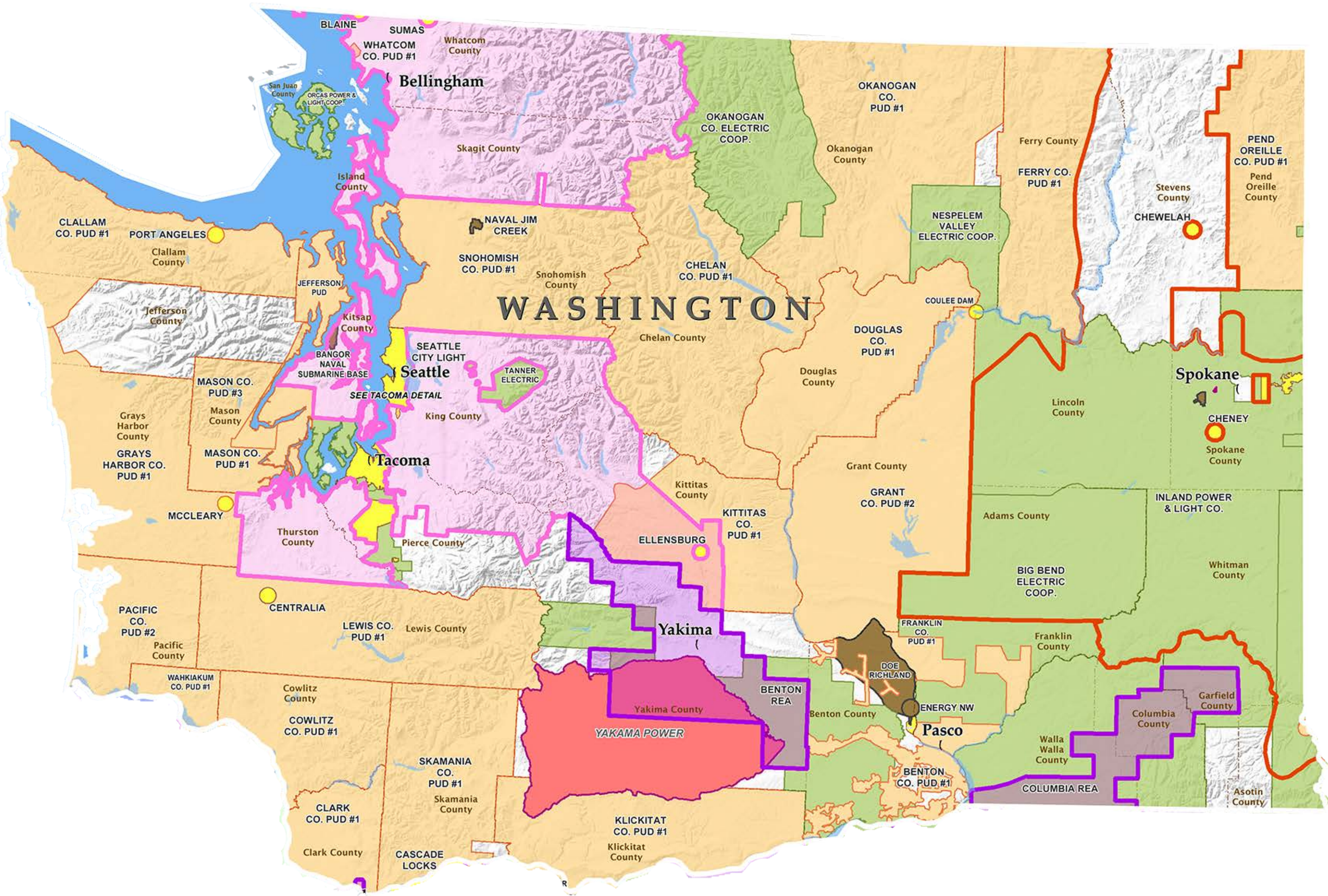
Introduction

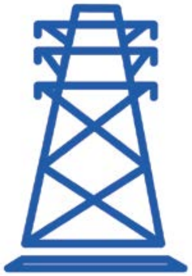


Background

Primary Research Question:

Can targeted EE help eliminate or defer transmission need?

Location and Need:



- BPA’s Tri-Cities (WA) distribution area
- Load level expected to rise from:
  - 320.6 MW to 325 MW by 2022
  - 3 MW annual
- Second 115 kV line would serve two subs in three utility areas:
  - Benton PUD
  - Benton REA
  - City of Richland
- Comprises 25% of Tri-Cities distribution area peak load
- A115 kV line cost expected between $4m and $6m
- Can EE help meet the 4.4 MW difference?

Scope and Methodology

Estimates of Savings and Cost:

- Transmission capacity need is in the **summer season**
- Potential expressed as **summer peak-coincident** MW savings
- Levelized costs expressed as **dollars per kilowatt-year** ($kW-year)
- Short & long-run technical and achievable technical energy efficiency potential
- Total net present value of costs and levelized costs of individual EE measures
  - Did not estimate cost-effectiveness from a traditional BCR perspective
- Produced supply curves for **summer peak-coincident savings & levelized costs**
- 90 categories & over 1300 EE applications including:
  - Residential, commercial, industrial, agricultural, & distribution efficiency

Steps for Estimating Potential

1. Define and Segment Transmission Area
2. Develop Energy Efficiency Measure Datasets
3. Develop Unit Forecasts
4. Forecast Technical Potential
5. Forecast Achievable Technical Potential
6. Estimate Program Costs and Levelized Costs

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1. Localized Transmission Area Characteristics

- Local climate characteristics
- Cooling equipment saturation much higher than broader NW
- Customer loads served by substations

2. Timing of Resource Availability

- Discretionary resources
- Lost-opportunity resources
- Short and long-term planning perspectives

Key Considerations

3. Information Used to Derive Peak-coincident Savings

- Peak period definition
- Feeder peak loading
- Building & end-use load shapes

4. Cost Metrics to Acquire Conservation Potential

- NPV of Total Acquisition Cost
- The relative cost of conservation

Incentive Scenarios

Achievable 85%	85% of all technically feasible energy conservation potential can be achieved over the 20-year study
BPA Incentives	incentive levels are equivalent to those offered by the 2017 conservation programs
BPA Incentives Plus	incentives are 50% higher than those offered by the 2017 conservation programs

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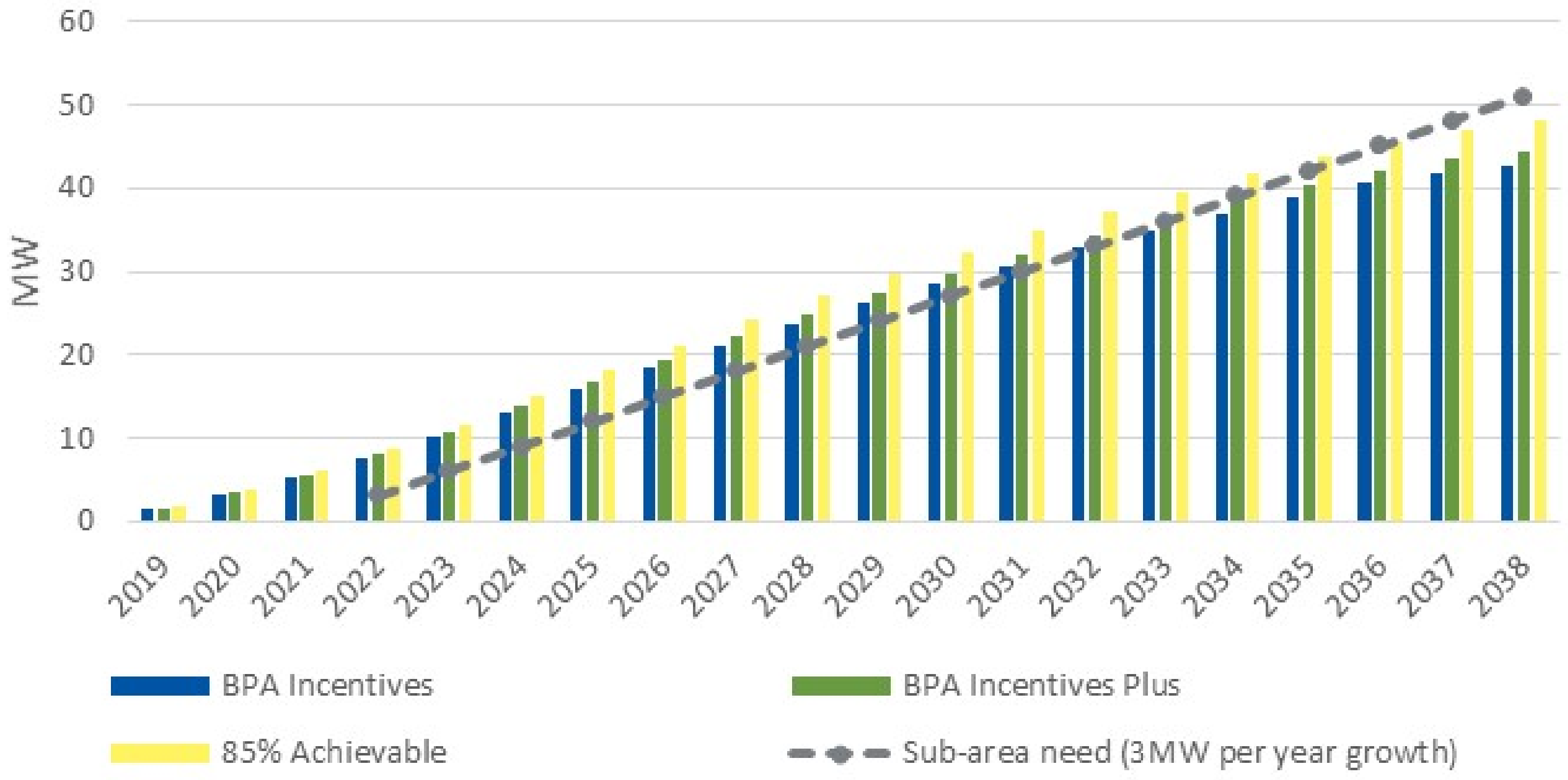
Achievable Technical Potential Forecasts and Need

- Potential exceeds need in the short run
- In the long run, there is not sufficient potential



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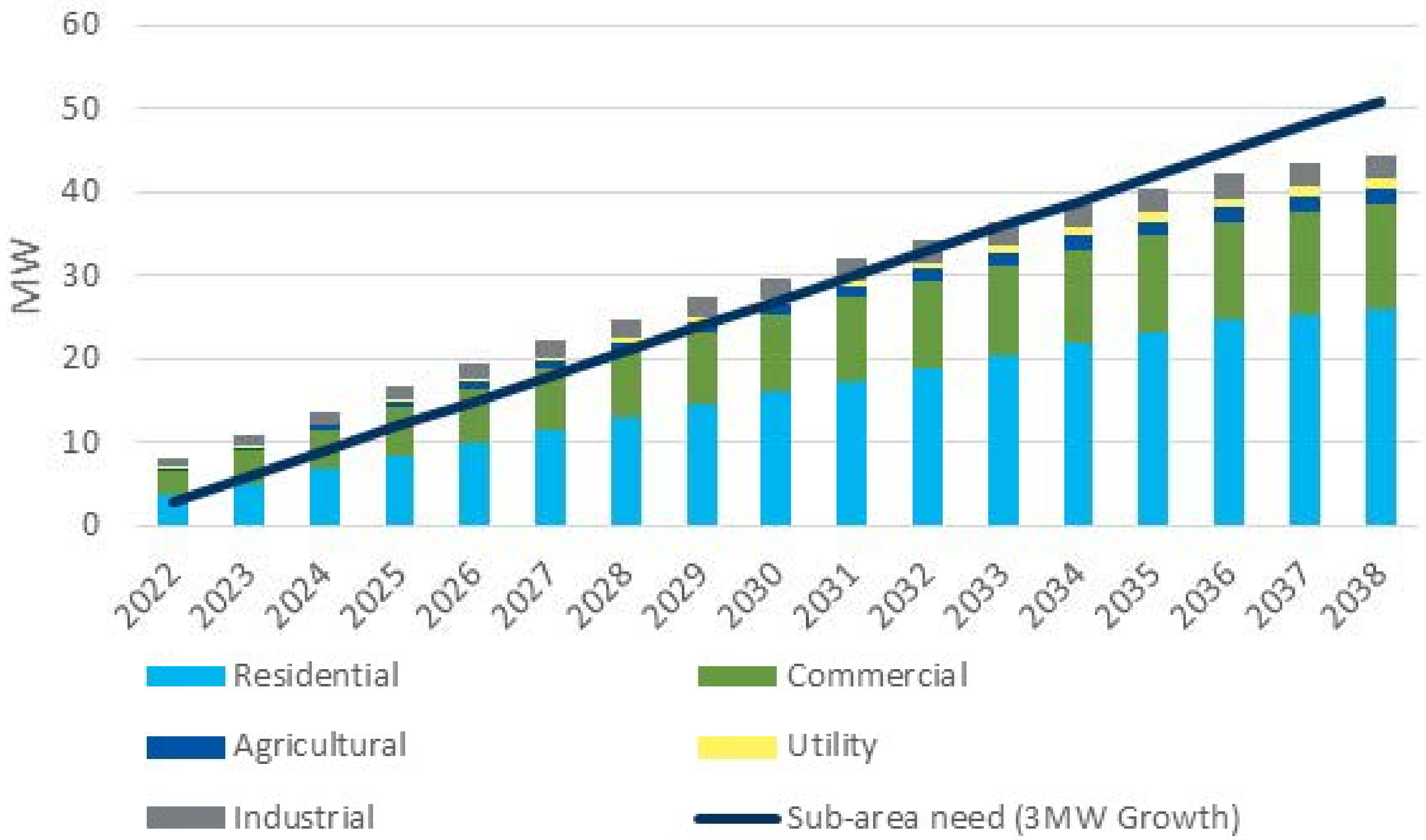
Results

Incentives + Scenario Technical Achievable Forecast and Need

- EE may defer the need for a new transmission line
- EE may not eliminate the need



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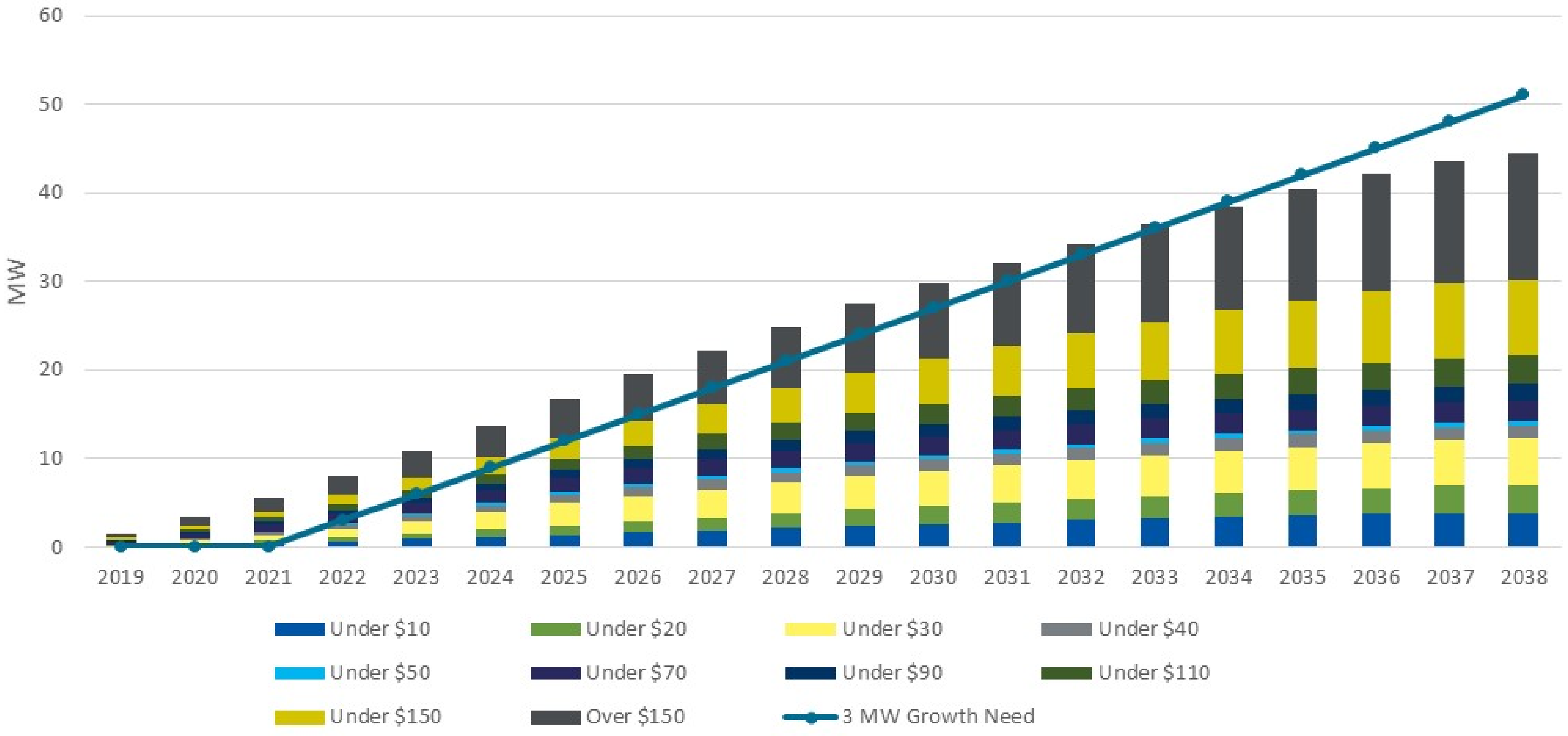
Results

Supply Curve ($/kW-year bundles) – Incentives Plus

- EE < $70/kW-year acquired, savings would be:
  - 3.7 MW by 2022, 7.9 MW by 2025,
  - 10.9 MW by 2028,16.5 MW by 2038



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Scope and Methodology

- Requires clearly defined transmission need
- Research needs to effectively identify measures

Data Considerations

- Data need to reflect unique area characteristics
- Accurate peak estimates depend on high-quality end-use load shapes and savings profiles

Cost-Effectiveness and EE as NWA

- Future studies should incorporate all energy-efficiency related costs and benefits
- The timing of the transmission line build could be a crucial element to evaluating cost-effectiveness of non-wires alternatives

Outcomes

Alternative Valuation Model (AVM)

- Bonneville developing internal AVM model for evaluating NWAs
- Compares **proposed wires investment** for specific load transmission areas, transmission paths, lines, substations, and customer utilities to a **proposed portfolio of NWAs**, including:
  - Energy Efficiency,
  - Demand Response, and/or
  - Battery Storage

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Thank You

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