Distributional Equity Analysis Compliance Filing

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Washington State Utilities and Transportation Commission

Overview

Community Solar Installation at Olympia High School

- Foundation and Context for Distributional Equity Analysis (DEA) Pilot Requirement
- Project Approach and Methodology
- Project Description:
  - Recognition
  - Procedural
  - Distributional
- Results
- Lessons Learned
- Next Steps

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Acronyms

BCA	Benefit Cost Analysis
CEIP	Clean Energy Implementation Plan
CBI	Customer Benefit Indicator
DEA	Distributional Equity Analysis
DOE	Department of Energy
DER	Distributed Energy Resources
EAG	Equity Advisory Group
ETIPP	Energy Transitions Partnership Project
IE	Income Eligible
GIS	Geographic Information System
GP	General Population
HIC	Highly Impacted Communities
LBNL	Lawrence Berkeley National Laboratory
VP	Vulnerable Populations

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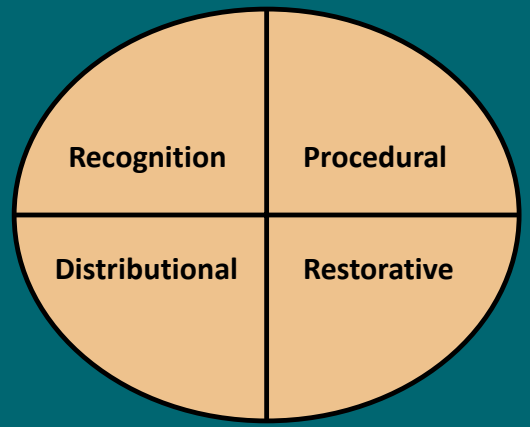
Cascade Natural Gas General Rate Case UG-210755 Final Order 09

Recognizing that no action is equity-neutral, regulated companies should inquire whether each proposed modification to their rates, practices, or operations corrects or perpetuates inequities.

Companies likewise should be prepared to provide testimony and evidence to support their position.

Meeting this expectation will require a comprehensive understanding of the ways in which systemic racism and other inequities are self-perpetuating in the existing regulatory framework absent corrective intervention.

PSE's Four tenets of Energy Equity



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Clean Energy Implementation Plan (CEIP) Equity Conditions*

CONDITION 8	PSE must work with the equity advisory group (EAG) and an advisory group to develop a new or revised distributed energy resource (DER) selection process that is: (1) consistent with the DER planning process in RCW 19.280.100 and (2) transparent, technology neutral, and robust in its comparison of DER programs considering cost and non-cost factors.
CONDITION 9	PSE must include the specified criteria under the classifications: Sensitive Populations, Energy Security/Insecurity, and other socioeconomic factors.
CONDITION 10	PSE will revise its designation methodology for vulnerable populations in the 2025 CEIP consolidating factors measuring the same attributes, include additional (specified) factors, and evaluate the effects of compounding factors.
CONDITION 12	PSE must include an additional Customer Benefit Indicators (CBIs) and metrics measuring the reduction of energy burden.
CONDITION 15	PSE must file a comprehensive CBI metric report card prior to the 2023 Biennial CEIP update.
CONDITION 20	PSE will designate a minimum of 30% of its tranche of DER, demand response (DR), and energy efficiency (EE) resources for named communities. PSE will develop a targeting approach with interested parties/advisory groups for the segment of Deepest Need within named communities. PSE will designate a minimum percentage of benefits that will flow to the Deepest Need segment.
CONDITION 21	PSE will develop mechanisms for serving customers in named communities in each of its individual DER programs. PSE will modify its program design for solar and storage DER programs to: (1) ensure benefits flow to named communities, (2) use criteria beyond income for program eligibility; (3) offer higher incentives for low-income customers, (4) ensure benefits flow to tenants in affordable multifamily housing (5) and target storage programs to vulnerable populations where increased reliability would reduce vulnerabilities.

* Docket UE-210795 Final Order 08 (June 6, 2023)

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Equity-Related 2022 General Rate Case Requirements*

Distributional Equity Analysis	• Develop process for a distributional equity analysis • Pilot the methods on a Distributed Energy Resource (DER) program • Participate in Commission-led process • Gain WUTC agreement • Report results of the distributional equity analysis
Corporate Capital Planning	Develop a process to include equity into capital portfolio decision making process, include in Enterprise Project Portfolio Management (EPPM) tool. Incorporate distributional equity analysis into Capital Spending Authorization (CSA) after the Commission led process.
Delivery System Planning	Identify ways to provide system value for all customers and achieve an equitable distribution of benefits and burdens to named communities. Incorporate benefits and costs related to equity in Investment Decision Optimization Tool (iDOT).
Performance Metrics	31 out of the 119 Performance-Based metrics are equity-related metrics that PSE is expected to report on to the WUTC.
Affordability	Launch Bill Discount Rate in October 2023 Launch Arrearage Management Plan in October 2024 Increased billing assistance (PSE Home Energy Lifeline Program (HELP) funding, Low-income Conservation and Weatherization incentives) Continue existing credit and collection processes
Clean Energy Management Program Participation	Investment up to $15M on Targeted Electrification Pilot, prioritizing lo-income, highly-impacted and vulnerable populations.

* Dockets UE-220066, UG-220067, & UG-210918 (*consolidated*) Final Order 24/10

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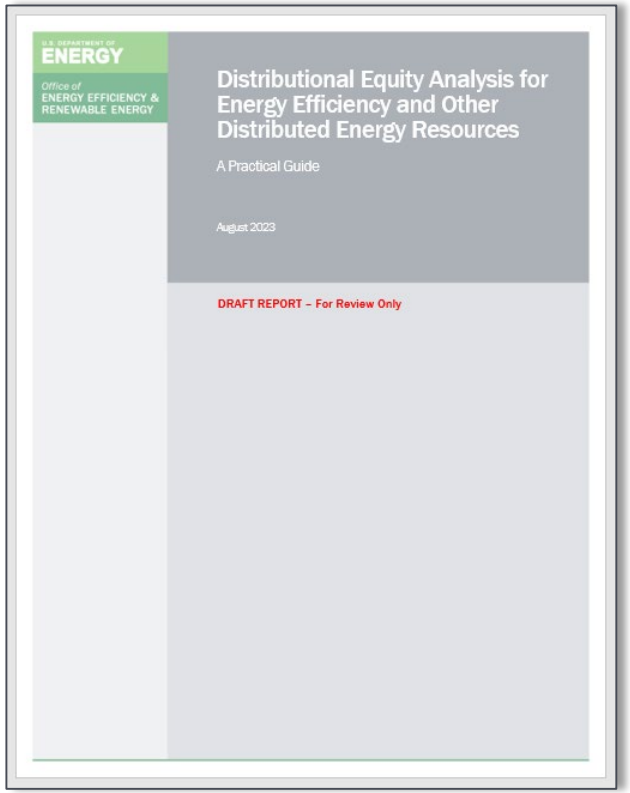
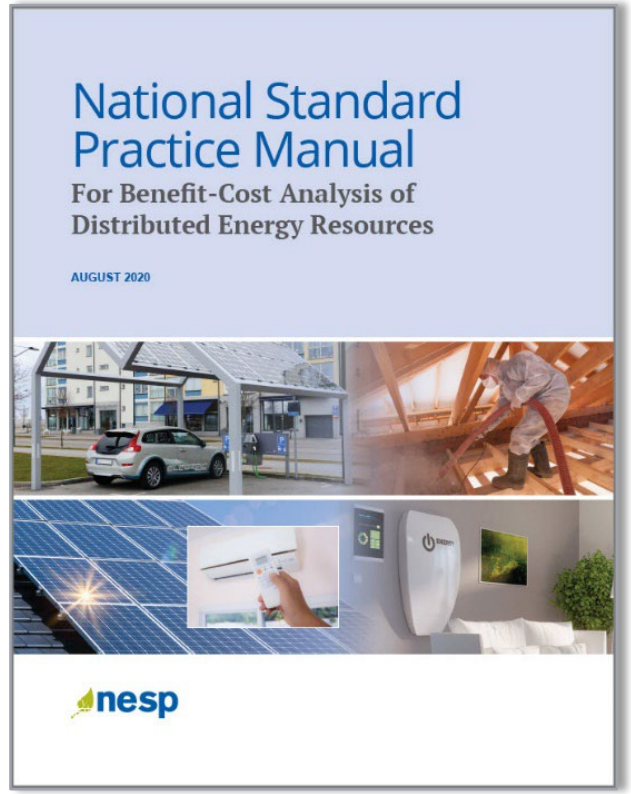
Our Approach

Follow the Cascade Order* framework requirement (four tenets)
Engage The Nooksack Community in procedural equity practices and apply advisory groups' guidance to the Olympia High School project
Select a methodology and apply it to a tangible project
Use the Benefit Cost Analysis (BCA) and Practical Guide to select DEA methodology as a model to apply to any BCA at Puget Sound Energy
Use PSE data and projects as a case study for the Practical Guide to inform national emerging practice (tool)
Incorporate equity to effect prioritization and decision making in balance with existing processes.





Regulatory Training Initiative (RTI) provides training on DEA and BCA

* UG-210755 Final Order 09 (August 23, 2022)

Slide adapted from RTI's DEA Training

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Distributed Energy Resources Composition

80 MWs of solar distributed energy resources (DERs) as listed in the CEIP.

The listed resources were largely in development at the time the DEA began.

PSE selected a representative sample of projects in coordination with interested parties with available data for the DEA.

Table 5.11: DER Solar MW targets overview

Resource	Type	Description	Capacity (2025)	Commercial Operation Date (COD)	Number of projects	Counties
Community Solar	Existing	Customer subscription to shares in renewable energy benefits from local solar projects	50 MW	2023-25	~25	Kittitas, Thurston, King, Pierce, Whatcom, Skagit
Green power solar grants	Existing	Annual endeavor that funds solar arrays at nonprofits, public housing authorities and Tribal entities serving low-income and/or BIPOC community members.	1.5 MW	2023-2025	20 - 30	All
Net metering	Existing	Customer-owned, behind the meter, solar <100 kW that is installed AFTER PSE's net metered capacity reaches 179.2 MW (the threshold for required net metering per RCW 80.60.030).	59 MW	2024-2025	5500-7000	All
Distributed generation (solar and hybrid) [from DSS RFP]	Existing	Developer and PSE owned projects in the range of 200 kW – 5 MWs. Projects include solar, storage and hybrid (solar + storage).	Solar: 9 MWs; Hybrid: 8.9 MWs solar	2025	10-15	Whatcom, Skagit, South King, Pierce, Thurston, and Kitsap
Solar Export Rate	Future	Customer owned distributed solar energy credits. Qualified Equity-Focused projects can receive an interconnection	13.6 MW	various	30-60	Any

Chapter 5: Specific Actions

Resource	Type	Description	Capacity (2025)	Commercial Operation Date (COD)	Number of projects	Counties
		allowance and upfront incentive.				
Residential Rent-to-Own	Future	PSE developing rent-to-own options for rooftop solar and residential battery for named communities and other residential customers	2 MW	various	TBD	various
Total	**All**		**144 MW**			

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LBNL and PSE Collaboration and Scope of Work

LBNL

Manage U.S. Department of Energy grant

Convene Advisory Board meetings

Use PSE projects as case study modeling DEA application

Online Tool development

Practical Guide development

National outreach

LBNL and PSE

Apply DEA methods to tangible projects as case studies to move from theory to practice

Select demonstration projects

Data collection

Engagement with the project community

Metric design and analysis

PSE

Operationalize process for a DEA

Pilot the methods on two DER projects

Participate in Commission-led process

Compliance filing with WUTC

Collaborate with Commission Staff on transition to the Equity Docket

Apply DEA approach to other BCAs, capital planning and distribution system planning processes

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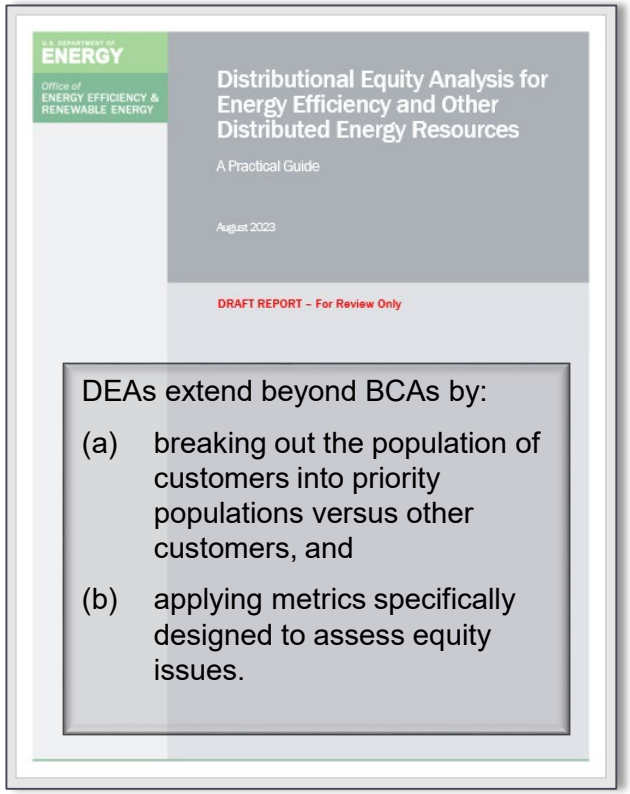
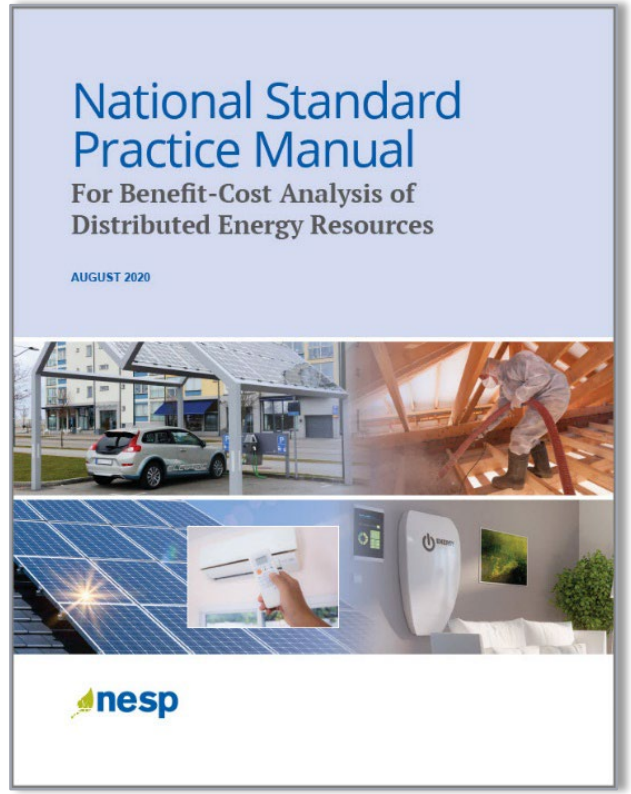
DEA and BCA Differences

DEAs are an analytical framework that account for equity impacts beyond the scope of conventional BCAs.

DEAs separate customers into priority populations and other customers to show how costs and benefits will affect each group.

DEAs complement but do not replace BCAs using many of the same principles, concepts, assumptions, and inputs.





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Slide adapted from RTI's DEA Training

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Articulate the DEA context

Steps		Options	Details	Selection and Justification			
				Olympia High School 1302 North Street SE, Olympia WA		Whispering Cedars Apartment and Administrative Building, Nooksack Indian Tribe Apartment: 7098 Mission Road, Everson WA Administrative Building: 5016 Deming Road, Deming WA	
Identify the DEA Application	**Decision Context** What decision will the results inform?	Various	Decision contexts include but are not limited to: decision-making processes for clean energy plans, integrated resource plans, distribution system planning	This analysis is a requirement of UE-0220066 Order 24/10, requiring PSE to conduct a pilot DEA which will be applied to the company's proposed acquisition of 80MW of DERs			
	Assessment Type Do the analyses assess equity of a single DEA program or a portfolio of programs?	Assess a single DER program serving the priority population.	Would be useful for assessing how well a DER program designed to serve the priority population achieves that goal. One of the most important DEA metrics in this case would be DER program participation. It might not be necessary to use the results of the BCA in combination with the DEA if the jurisdiction has decided that the program should be implemented regardless of the BCA results*.	☑	The DEA will be used to compare the priority population with the base population both before the project and following enrollment.	☑	The analysis will be grounded in a theoretical marketing effort of approximately a 1200 customer radius from the apartment complex and administrative building necessary to recruit 100 subscribers. The DEA results from each location will be compared to evaluate the ability for the community solar program to serve the priority population. The DEA results will also inform additional decision-making for targeted investments in income-eligible customers.
Determine DEA Timeframe		Retrospective DEA	Takes Place after a program has been implemented. In this case, data and metrics will ideally be sourced from actual, historical program data.	☑	The DEA will use data from 2019 to the present and compare impacts prior to the implementation of the community solar project with post implementation.	☐	
		Prospective DEA	Takes place before a program has been implemented. In this case data and metrics will involve more assumptions and will be based on forecasted estimates or proxy data.	☐		☑	The Nooksack Community Solar Project is still in the planning phase and is expected to be installed in 2024. The credits are currently estimated at $9 per share, per month and each customer will be able to subscribe to up to two shares.

** Where the DEA may be used to assess a single DER program serving the priority population, it may not be necessary to use the results of the DEA in combination with the BCA if the program should be implemented regardless of BCA results. This applies for the Olympia High School project which was already implemented, and the Nooksack project which is in planning stages but already committed. A required low-income program may be supported without conducting a BCA. The DEA could assess the equity implications of the project as opposed to deciding to run the project.*

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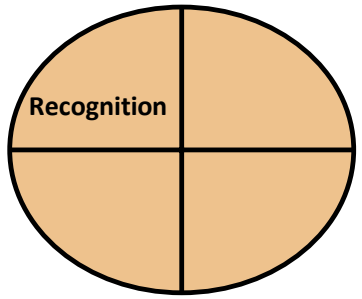
PSE Selected Two Community Solar Projects for The DEA Pilot



https://nooksacktribe.org/

https://www.facebook.com/olympiahighschool/

Location	Apartment complex owned by Nooksack Indian Tribe land	Olympia High School Rooftop
Status	Design Phase	Implemented in 2021
Size (kW)	50 kW	200 kW
Subscriptions	Undetermined	136 shares; fully subscribed 20% income-eligible shares
Potential Non-energy Benefits	Resilience/Reliability (dependent on battery storage feasibility)	Education

Based on discussions with the school district, PSE is working to provide the school access to real-time generation data, that science teachers can utilize as a teaching tool to compare and contrast system output with other solar projects

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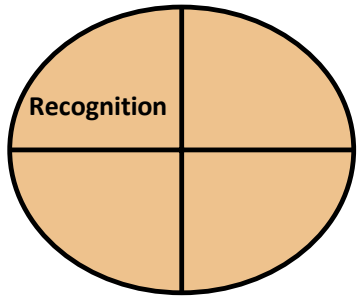
Identify priority populations, example indicators could include:

Energy Burden	Environmental & Climate Hazards	Socio-Economic Vulnerabilities	
Energy burden	Cancer risk	>30-minute commute	Linguistic isolation
Non-grid connected heating fuel	Climate hazards: Extreme heat/loss of life	Disabled population	Mobile home
Outage duration	Diesel particulates	Food desert	No vehicle
Outage events	Homes built before 1960	Homelessness	Access to parks
Transportation costs	National Priorities List proximity	Housing costs	Population >=65yr
	Traffic proximity	Incomplete plumbing	Renters
	Toxic facility proximity	Internet access	Single parent
	Water discharge	Job access	Unemployed
		< HS education	Uninsured
		Linguistic isolation	
		Low-income	

Indicators above listed by LBNL, items highlighted in yellow represent some, but not all, indicators used in PSE's analyses of priority populations.



PSE uses the quadrants of recognition and restoration equity to address institutional justice. As part of recognition justice, PSE has mapped its priority populations including historical factors like red-lining and climate risk factors.

PSE considers that context in how to apply restorative equity to improve the historical and present experiences of priority populations

Slide adapted from RTI's DEA Training

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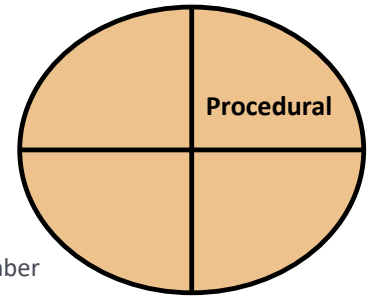
Pilot Relationship-Based Engagement Model

LBNL Advisory Board feedback on Google Jamboard November 2023 (above)



The CCEAP team engaged 340 low-income residents and 61 agencies, municipalities, organizations and Tribal entities that serve residents in named communities and communities facing language access barriers.
We sought their knowledge on:
how to build trust with communities,
how to develop co-created community content and experiences, best practices from their experiences,
a better understanding of challenges and barriers their communities are facing,
and successful engagement approaches

PSE engaged named communities on the future of DER products: Community Engagement Summary September 2022 – May 2023

PSE Low and Moderate Income Roundtable Presentation November 2023

LBNL convened DEA Advisory Group review project selection, tool, and guide

November 2023

LBNL's Advisory Board was comprised of:
Academics
Consultants
Members of PSE's EAG
Nonprofit Staff
NRECA
NARUC
Utility Commission Staff
Utility Staff

DOE Strategic Energy Planning Workshop Nooksack Tribe February 2024

Participants included:
U.S. Department of Energy and LBNL
Nooksack Elders
Nooksack Staff
Spark Northwest
PSE

The survey was fielded in five languages:
Chinese Simplified,
English,
Korean,
Spanish,
and Vietnamese
to a stratified sample of:
Communities facing language access barriers
Low-income households
Military/Veteran Communities
Rural Communities
Seniors
Tribal Communities
Young BIPOC Adults
WA BIPOC Adults

Customer Education and Awareness Program Survey

August 2023

Equity Forum Events in Mt. Vernon and Renton via EAG

September 2023

Attendees recruited through PSE's EAG

PSE Advisory Groups informed updates to Community Solar tariff expanding access and benefits for income-eligible participants 80MW DER

September 2023

Low Income Advisory Group,
Conservation Resources Advisory Group,
EAG

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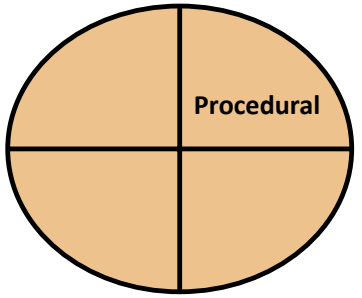
Principles of Engagement

PSE was invited to attend the DOE's Energy Transitions Partnership Project (ETIPP) workshop with the Nooksack Indian Tribe. PSE had the opportunity to witness and participate in procedural justice specific to a Tribal Nation setting.

The workshop emphasized the following principles:



Be invited: It is important to allow the Tribal Community to invite outsiders

Invite a qualified facilitator: ETIPP invited two Navajo facilitators to the three-day workshop; they had specific experience with Indigenous Communities facilitating similar energy planning meetings

Describe your lived experience: Tribal community members want to hear about your "qualifications" for working with them, which include your technical background and your cultural background

Build trust: The workshop took place over three days on the Nooksack Tribe's own land, this allowed all participants to build a working relationship on the topic of energy transition in a way that prioritized the convenience and needs of the Nooksack Tribe

Engage as an active listener: Non-Tribal members served mostly as listeners - taking notes and asking questions - while the Nooksack Tribe gave an oral history of their people and land, described their barriers to clean energy, and brainstormed their own solutions

While contextualized in the specific setting of the Nooksack Tribe, these principles illustrate the spirit of procedural equity that can be applied to most, if not all, community settings when conducting energy equity work.

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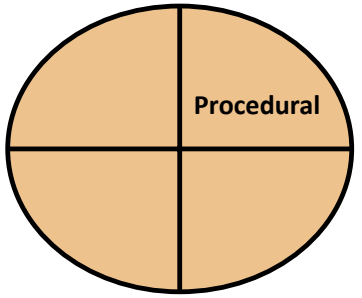
Establish interested party engagement at the beginning of the DEA that is sustainable throughout the entire process



Priority population input should directly inform and influence all aspects of the DEA.

Stage	Action
Identify priority population	Consider whether and how to enable communities to self-designate as a priority population
	Choose the set of indicators for the priority population
	Determine the scope of the priority population
Develop DEA metrics	Develop a full set of system-wide equity metrics
	Winnow down system-wide equity metrics to a set that is more appropriate for DEA
Apply DEA metrics to priority populations	Incorporate interested party input on data collection and analytical tools
	Review and critique data input to the DEA, i.e., ground-truth
	Protect data privacy and encourage equitable data practices
Present and interpret DEA results	Develop benchmarks for metrics
	Determine importance weights for each metric
Make decisions with BCA and DEA	Define or clarify DEA pass/fail criteria
	Draw conclusions from both the BCA and DEA results

Slide adapted from RTI's DEA Training

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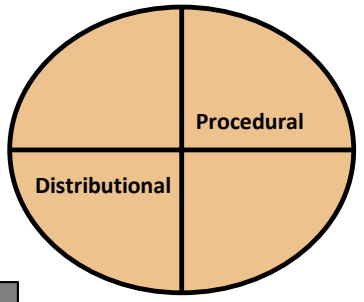
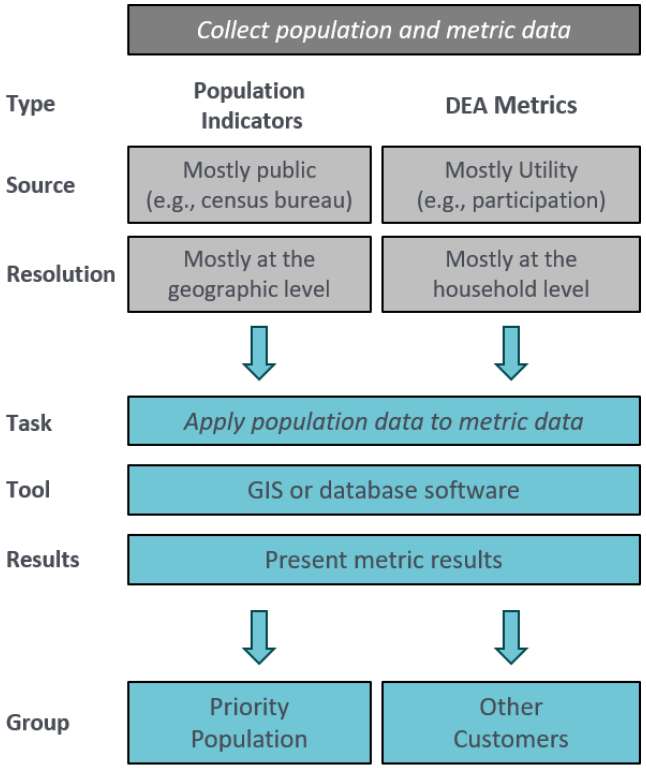
Engagement Informed Analysis Process Olympia High School



Priority Population Classifications	General Participants (GP)	Income Eligible (IE)
Total Participants	74	37
Highly Impacted Community (HIC) Yes	10	6
HIC No	56	25
Vulnerable Population (VP) High	11	18
VP Medium	29	11
VP Low	26	2
HIC Yes & VP High	6	4
Energy Burdened	11	18
Deepest Need	4	13

For GP and IE participants, multiple indicators of prioritization identified (2023 CEIP Update)



For the Olympia high school project, we are comparing **IE** and **GP** customers.
In this perspective the GP subscribers are the "control" group.

Alternatively, we can also think of the control group as both of the subscriber groups *before* the initiation of the program.

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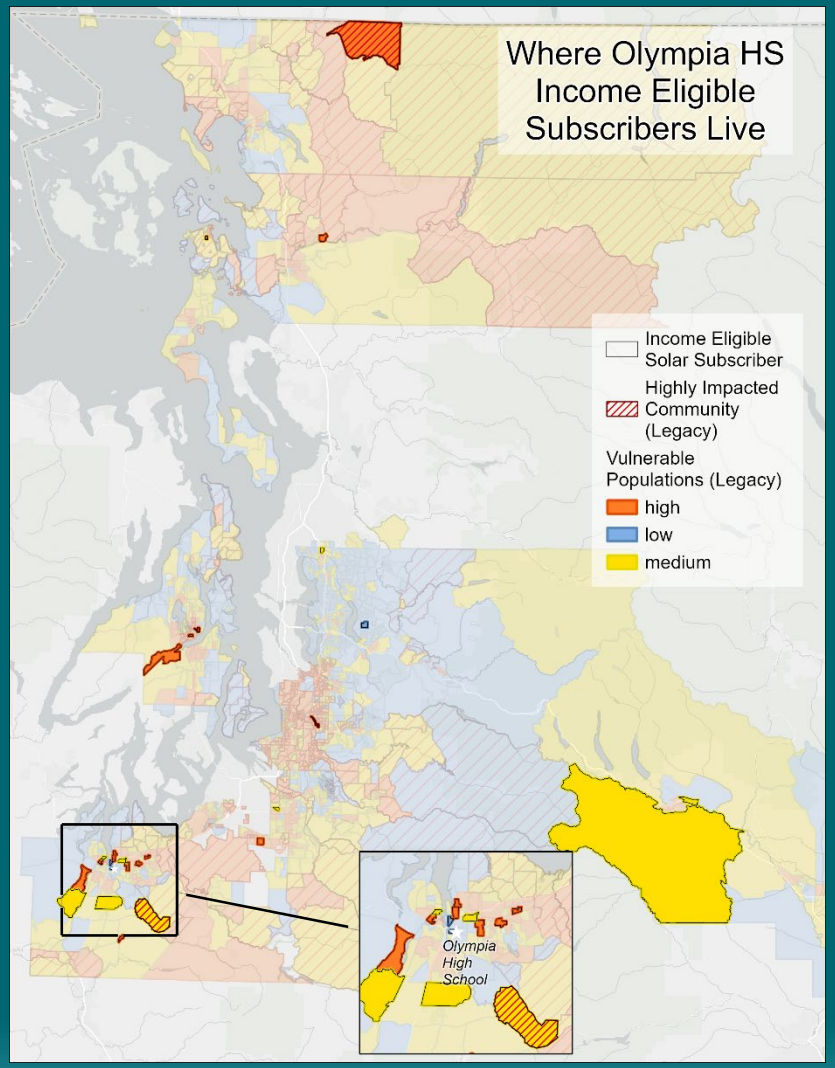
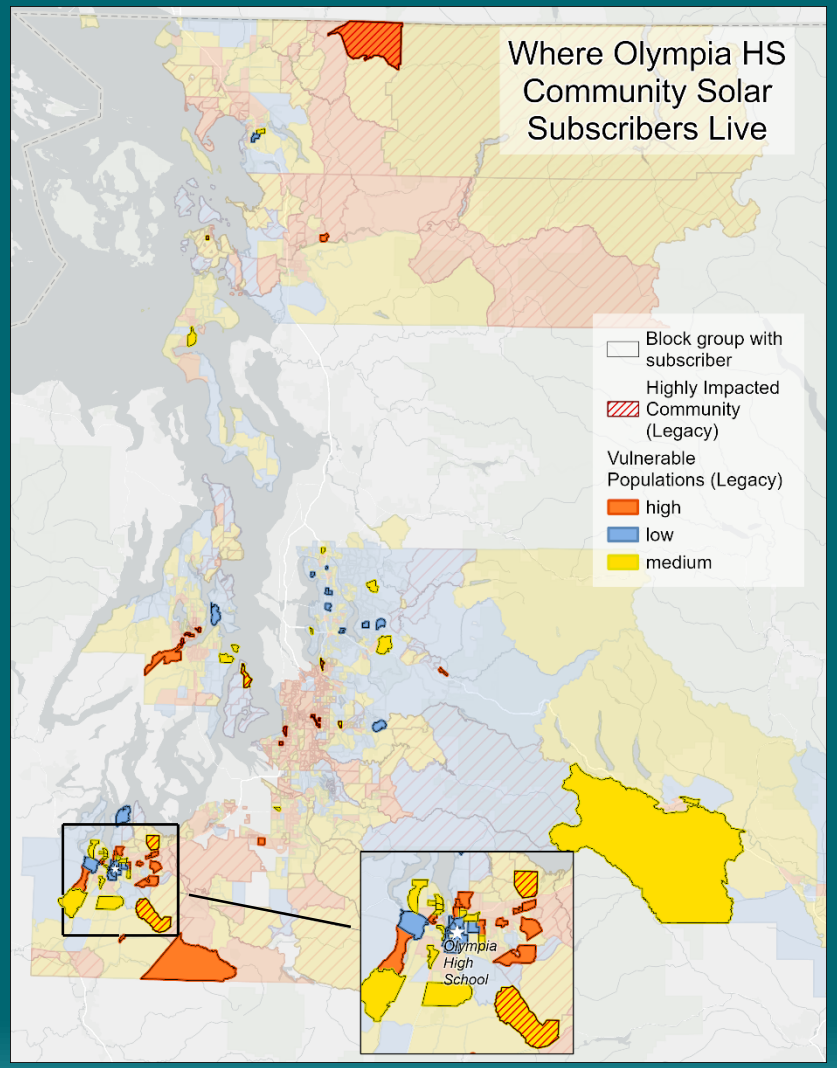
Dispersion of Olympia High School Community Solar Participants

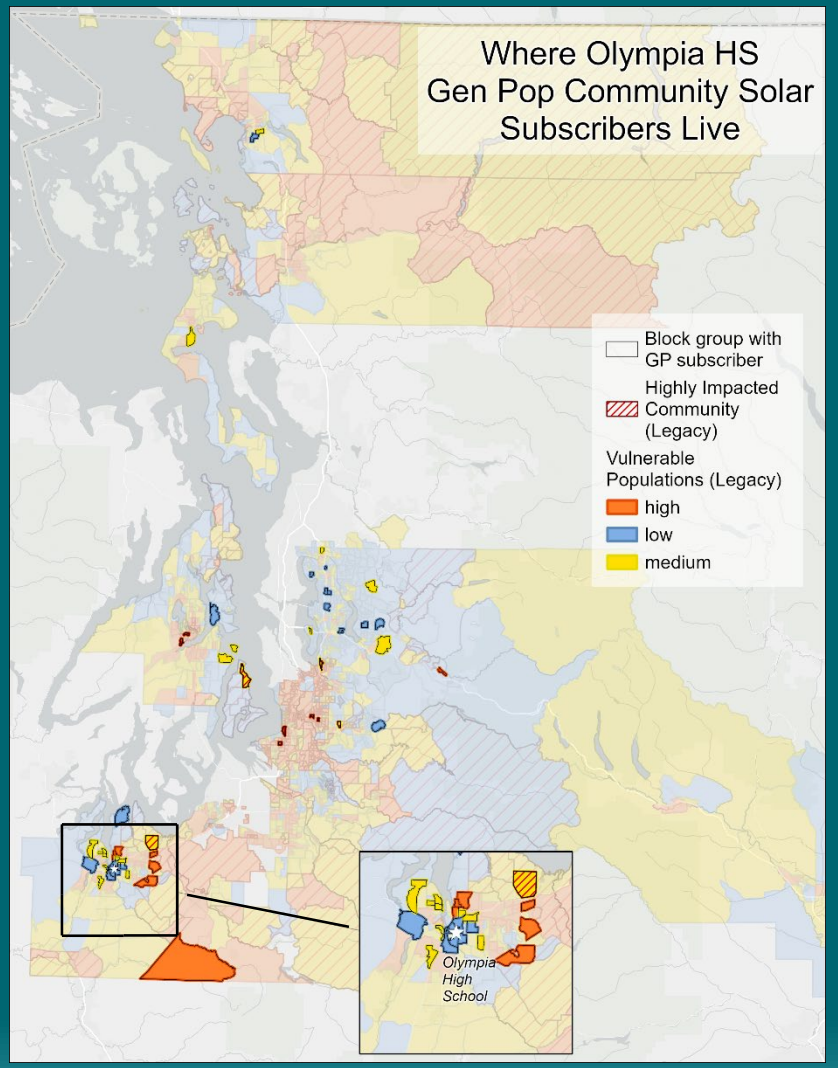
Income Eligible



All Subscribers



General Participants



HIC and VP legacy labels refer to PSE's named communities classifications as filed with its CEIP.
In the 2023 update PSE revised its data and methods as detailed in the CEIP Biennial Update and adopted the revised classifications January 1, 2024.

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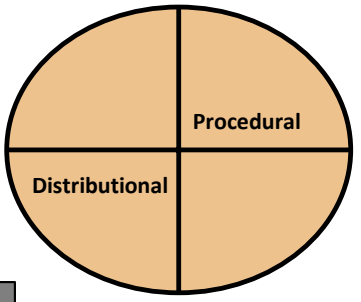
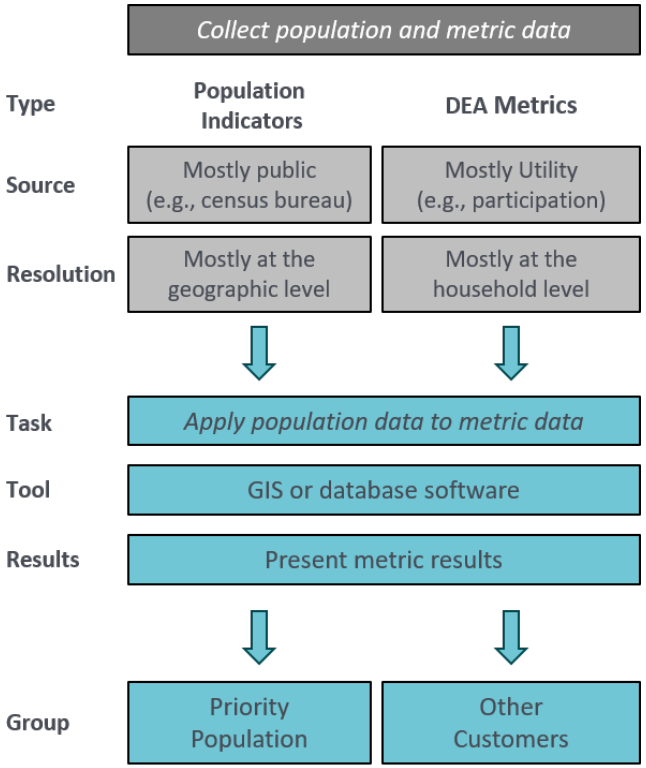
Engagement Informed Analysis Process Nooksack Project Sites

Two locations were evaluated for the Nooksack Project

Priority Population Classifications	Whispering Cedars Apartments	Nooksack Administration Building
Total Participants	1354	1217
Highly Impacted Community (HIC) Yes	1197	1194
HIC No	157	23
Vulnerable Population (VP) High	1129	610
VP Medium	205	584
VP Unclassified	20	23
HIC Yes & VP High	1129	610
Energy Burdened	308	334
Deepest Need	156	184

Site Selection Process: a radius was drawn from each project location to select approximately 1200 customers to compare priority populations as part of the site evaluation process.





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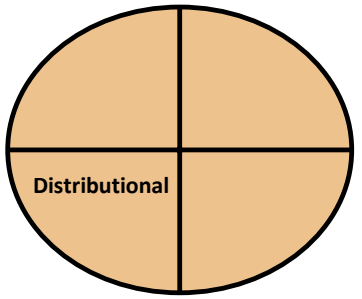
Develop DEA metrics that are specific to goals

Criteria	Description
Distributional	Equity metrics for a DEA should focus on distributional equity impacts. Broad, systemwide equity *metrics* tend to cover many dimensions of equity (institutional, procedural, distributional, restorative). DEA is not capable or designed to address all these dimensions.
Discrete	Many metrics might overlap or measure the same impact in different ways. DEA metrics should minimize overlap with each other to avoid double-counting of the same or similar impacts, where possible.
Tied to equity goals	Metrics should capture the costs and benefits relevant to a jurisdiction's policy goals.
DER impact	When applying a DEA to DERs, metrics should focus where utility DER investments, or the investments that they defer or avoid, are likely to have an impact.



A System Wide equity analysis considers a more comprehensive scope of equity including all four dimensions of the Energy Equity Model.

This differs from the DEA which specifically addresses the question: "What are the distributional equity impacts of utility resource investments in the context of cost-effectiveness evaluation?" (quote from the Practical Guide).

The DEA process does not have a direct impact on equity outcomes under the other quadrants, however, it may implicate consideration of elements to the extent that they inform the engagement methods, data, etc.

Slide adapted from RTI's DEA Training

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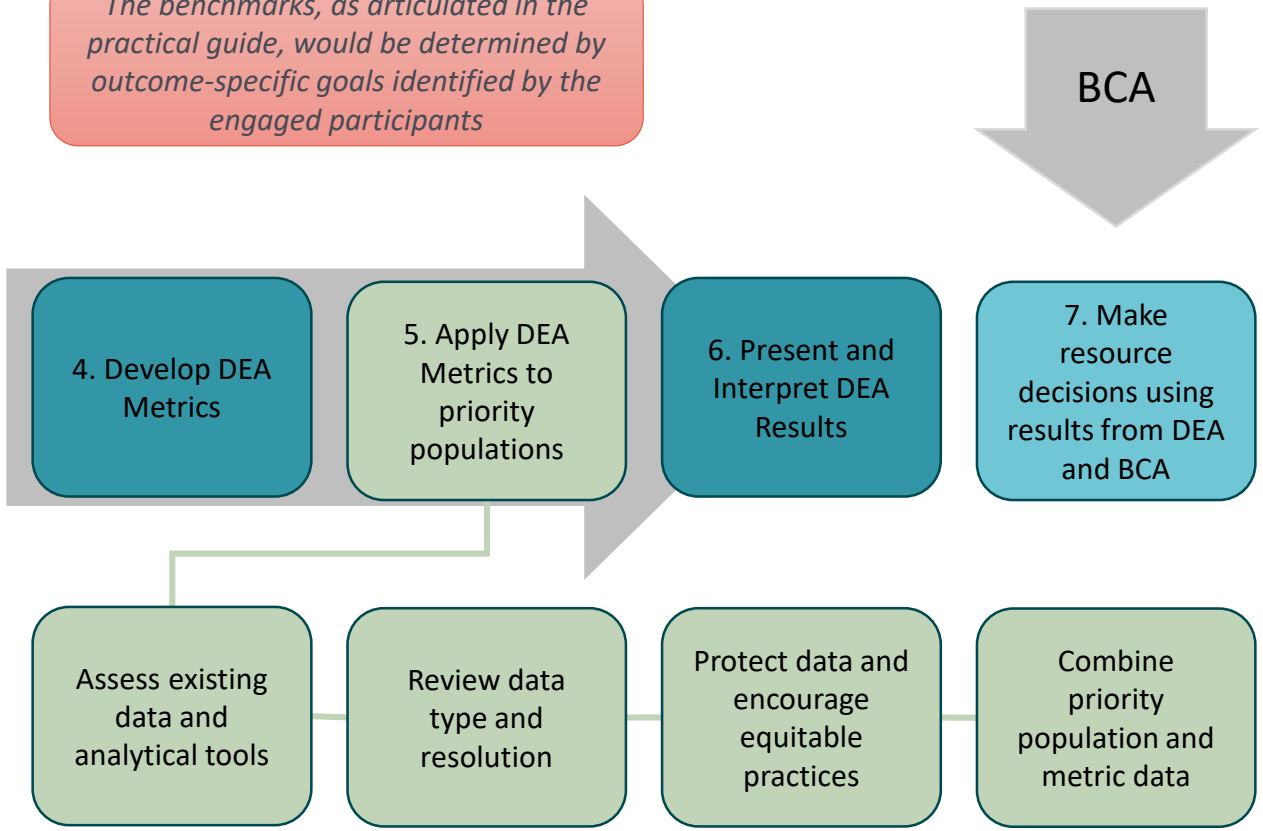
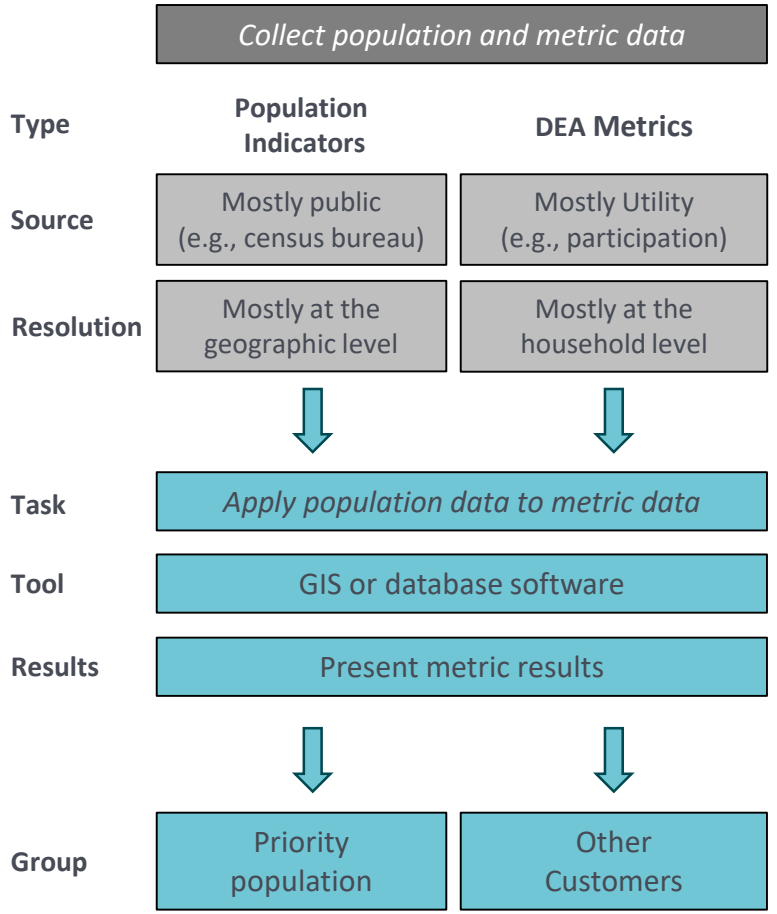
Apply DEA metrics to priority populations and other customers to make useful comparisons. Note the difference between population indicators and DEA metrics

The benchmarks, as articulated in the practical guide, would be determined by outcome-specific goals identified by the engaged participants





Slide adapted from RTI's DEA Training

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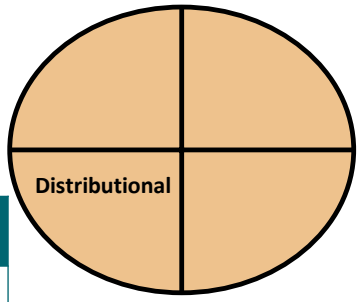
Analysis Process Applied to Project Sites



PSE Customer Benefit Indicators as DEA Metrics

Olympia Project		Metric	Units	CBI Goal	Nooksack Sites	
GP	IE				Whispering Cedars	Administration Building
	X	Improved Participation in clean energy programs from named communities	Count of participating customers	Contribution towards PSE CBI goal	X	X
	X	Decrease in number of households with high energy burden	Count of project customers moved from EB	Contribution towards PSE CBI goal	X	X
		Increase in culturally-and-linguistically accessible program communications for named communities	Outreach materials and impressions count	Contribution towards PSE CBI goal	X	X
X	X	Reduced Greenhouse gas emissions	Reduction vs PSE portfolio standard	Contribution towards PSE CBI goal	X	X
		Decrease in frequency and duration of outages (if battery storage included in project)	SAIDI SAIFI CAIDI CAIFI vs. neighboring circuit average	Contribution towards PSE CBI goal	X	
X	X	Improved access to reliable, clean energy	Count of customers with access to emergency power	Contribution towards PSE CBI goal	X	X
	X	Decrease residential arrearages and disconnections for nonpayment	Increased participation in Energy Assistance and Bill Discount Rate Programs	Contribution towards PSE CBI goal	X	X

CBI = Customer Benefit Indicator
GP = General Population
IE = Income Eligible

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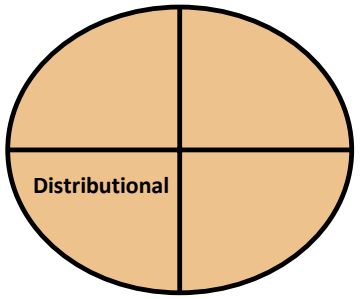
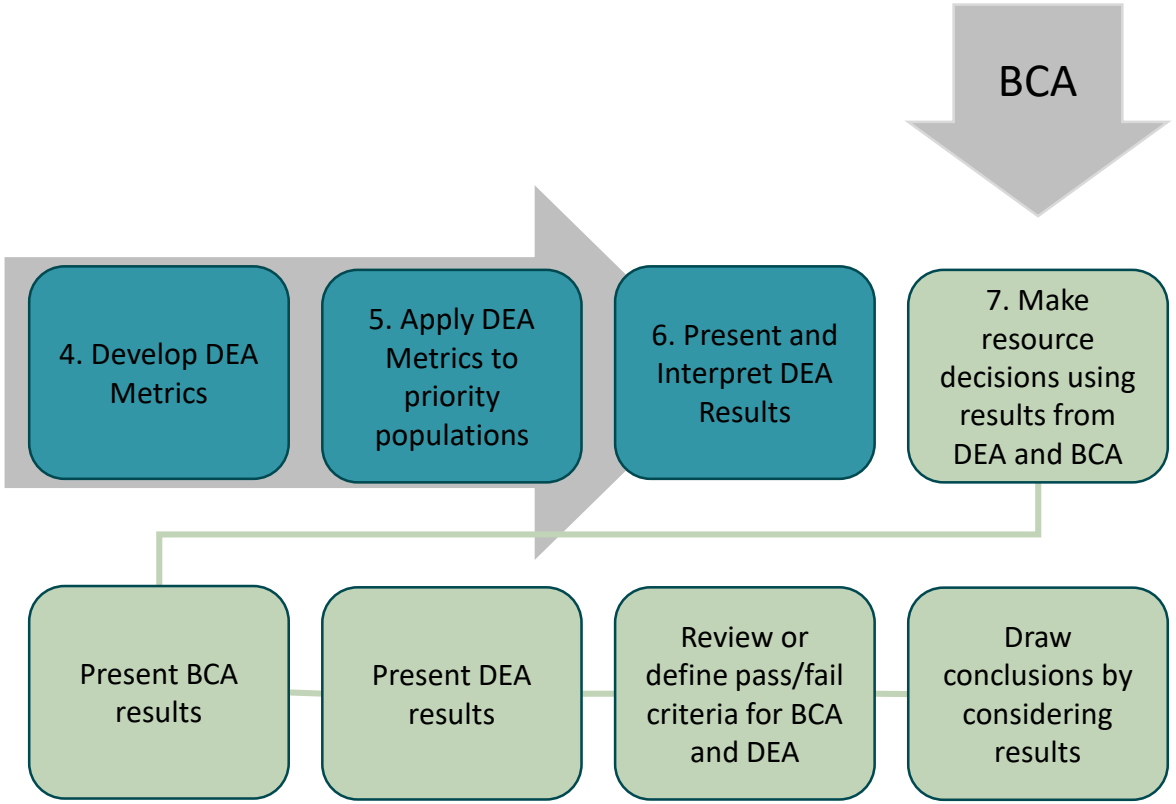
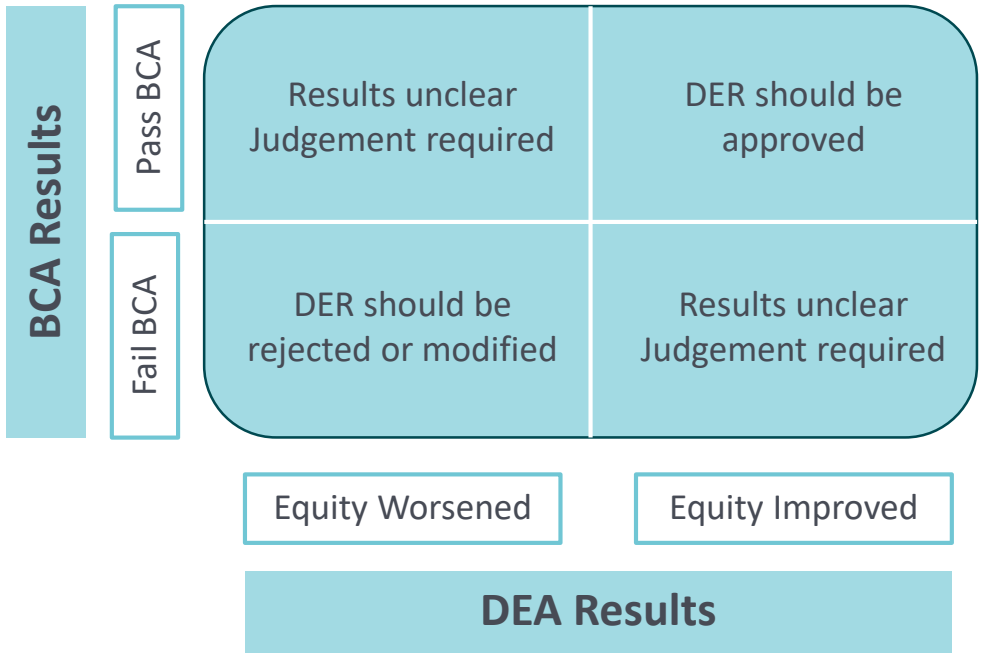
Make resource decisions by comparing the DEA and BCA outcomes for a specific DER project or portfolio of projects







Slide adapted from RTI's DEA Training

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Results: Applying the Emerging Methodology

DEA Step	Progress-to-Date
1. Establish the interested party process	Hosted the LMI Integration Roundtable Conducted customer education and awareness survey Convened DEA Equity Advisory Group (2x times) Participated in ETIPP workshop with Nooksack Indian Tribe Advised LBNL on developing an interested party engagement guide
2. Articulate the DEA context	Selected the Olympia High School and Nooksack Tribe community solar projects for a retrospective and prospective analysis (i.e., assessing a single DER program serving the priority population)
3. Identify priority populations	Used the priority population indicators for vulnerable population (VP) and highly impacted communities (HIC) from the 2023 Biennial CEIP Update
4. Develop DEA metrics	Program participation Affordability (energy bills, energy burden, and shutoffs) Reliability/resilience (reduction in power outages)
5. Apply DEA metrics to priority populations	Began data analysis, looking at impacts on HICs and VPs
6. Present and Interpret DEA results	Discussed with EAG 7/16/2024, results filed at WUTC 7/19/2024
7. Make resource decisions using results from DEA and BCA	To be determined

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Test How the Emerging Methodology Impacts Community Solar Projects: Income Eligible vs. Base Customer Population

Distinctions Between Share Types		
	Income Eligible	General Participant
Share size	1.46 kW	1.46 kW
Monthly subscription cost per share	Free	$20
Energy credits	Flat $9 per month: PSE annually trues up IE credits to account for production benefits	$0.07613/kWh generated per share: post October 2023 tariff revision
Share limit per subscriber	2 shares	Up to 120% annual electricity usage

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Olympia High School: DEA Metrics

Metric	Unit	Notes
Access	Average shares/subscriber	Calculated the average number of shares per subscriber for IE and GP customers
Bill Savings (per share)	Average monthly savings/share	If there are IE and GP subscribers, we can compare the savings for both share types.
Bill Savings (total)	Average monthly savings	This will differ from the per share savings if customers are allowed to subscribe to more than one share and/or if they are GP and IE shares.
Subscribers from Highly Impacted Communities (Priority Population)	Percent of subscribers who are in Highly Impacted Communities	Used the definition of Highly Impacted Communities as defined by the Washington State Department of Health

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Olympia High School: Simple Results

Metric	Unit	Priority Population (IE Subscribers)	Other Customers (GP Customers)
Participation	Average shares/subscriber	1	1.9
Bill Savings (per share)	Average monthly credit/share	$7.33	$20 - 6.65 = - $13.35
Bill Savings (total)	Average monthly savings	$7.33*	- $4.06**
Priority Population Participation	Percent of subscribers from Highly Impacted Communities	13.5%	9.5%

* *The IE credit changed in October 2023 to $10 a share, the DEA study period precedes this date when the IE bill credit was $7 so the reported finding is accurate and distinct from the $9 value IE share value reported elsewhere in this document.*

** *The -$4.06 value is pulled from the average bill "saving" across the entire study period (post Community Solar installation in 2021), so it includes both summer and winter months.*

Interpreting the results:

Income-eligible participants had less access to community solar

General participants are paying to participate, and thus do not see any savings

Challenges:

We were limited in our ability to do a rate impact analysis, and thus could not evaluate the impact of the community solar project on other utility customers not participating in the community solar project

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Nooksack Indian Tribe: DEA Metrics

Metric	Unit	Notes
Bill Savings (per share)	Average monthly savings/share	If there are IE and GP subscribers, we can compare the savings for both share types.
Bill Savings (total)	Average monthly savings	This will differ from the per share savings if customers are allowed to subscribe to more than one share and/or if there GP and IE shares.
Deepest Need Customers (Priority Population)	Percent of subscribers who are Deepest Need	We can compare the representation of customers in the radius around each project site. We used a random sampling method to predict enrollment.
Bill Impact	Estimated percent bill reduction with community solar	Reference: $9/share for IE; for GP customers, we can model the solar output using NREL's PVWatts tool
Reliability (analysis outstanding)	Change in the number and duration of outages at the customer level	Since the apartment building is the only one being considered for a battery, we will model the change in outages using historical data and the proposed battery specifications: (36kW max power; ~1,500kWh for 24 hour backup)

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Nooksack Indian Tribe: Simple Results

		Whispering Cedars		Administrative Building	
Metric	**Unit**	IE Eligible	General	IE Eligible	General
Bill Savings (per share)	Projected average monthly savings/share	$9 (-6.6%)	-$11.60 (+8.6%)	$9 (-2.9%)	-$11.76 (+3.8%)
Deepest Need Customer Participation	Projected percent of subscribers who are Deepest Need	7.4%	4.1%	20.6%	2.6%
Reliability	Projected change in the duration of outages at the customer level	100% reduction based off of 2019-2024 historic outage data		None - no battery is being considered for this site	

Interpreting the results:

Projected bill savings per share follow the same trend as the existing Olympia HS project.

We see a greater proportion of customers flagged as Deepest Need in the radius of the Administrative Building, for all enrollment scenarios.

Challenges:

The distribution of reliability benefits depends on whether or not the customers of the apartment complex enroll in community solar

The IE income threshold (below 80% of the area median income or 200% of the federal poverty level) and the criteria for deepest need (more than 10% energy burden) are derived from distinct analyses which may explain the unexpected result of 4.1% and 2.6% Priority Population participants showing up in the general subscribers data set.

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What have we learned:
Pros and Cons of Study Perspectives

	Retrospective Analysis	Prospective Analysis
Pros	Historical data Known impacts to priority and general populations Can run “what if” analysis to tweak similar, but prospective programs	Can set intentional goals for the program Can identify intentional populations (e.g., priority vs. general)
Cons	Can’t set intentional goals for the program Harder to identify intentional populations for community solar project	Need to make assumptions about program impacts Difficult to balance timing of interested party engagement with determining project feasibility

Both the retrospective and prospective analysis provide insight on extent of the program design in serving priority populations, and in particular, HICs and VPs. This may inform decisions around elements such as the number of shares available to IE and non-IE customers, the credit amount for IE subscribers, etc.

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What have we learned:
Difficult to isolate distributional equity from other energy equity principles

Energy Justice Tenets	DEA Steps						
	1. Establish Engagement Process	2. Articulate DEA Context	3. Identify Priority Populations	4. Develop DEA Metrics	5. Apply DEA Metrics to Priority Populations	6. Present and Interpret Results	7. Make Resource Decisions using BCA and DEA
Recognition							
Procedural							
Distributional							
Restorative							

Indicates where the energy equity principles and DEA steps overlap

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What have we learned:
Community-Based Participatory Research approaches could strengthen the DEA

In this pilot, LBNL attended an ETIPP workshop with the Nooksack Indian Tribe, and reviewed PSE's existing community engagement efforts to determine community goals and priorities regarding community solar.

The DEA pilot suggested to LBNL researchers that the existing Practical Guide could benefit from additional guidance to utilities and stakeholders on how to engage with communities.

LBNL began developing a Community Engagement Guide intended to support an organization in developing a sustainable community engagement strategy for conducting DEAs for DERs.

Drawing upon the work of activists, scholars, and practitioners, the guide points users to key resources and considerations that may address the common barriers to conducting meaningful and accessible engagement.

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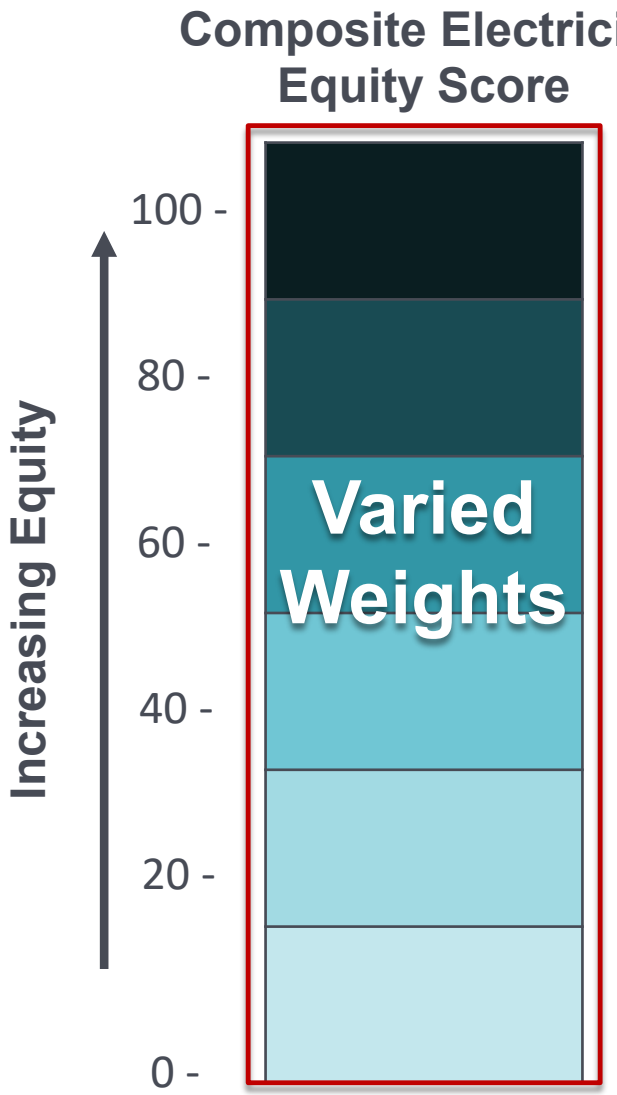
What have we learned:

DEA Equity Metrics can vary widely, depending on goals and data availability. LBNL is developing a database for potential DEA metrics and data.



Equity Blocks	Example Definition	Example Datasets
Grid Connection	% of customers not connected to electric grid	NREL LIDAR data of aerial imagery Google Earth
Reliability	SAIFI Median Household Income/10K	Larsen et al. (2020) reliability data Dunn et al. (2019) web scraping tool EIA-861
Resilience	% of customers experiencing lengthy outage (> 48 hours)	Poweroutage.us Utility data
Affordability	% of customers with an energy burden < 10%	EIA / Open EI Average Rates NREL ResStock / ComStock Profiles Census / American Community Survey
Health & Environment	Avoided CO_2, NO_X, $PM_{2.5}$ and SO_2 damages (% change from baseline)	Integrated Air Quality Models: EASIUR Model AP3 Model
Access to DER & Storage	% of customers with installed rooftop solar	LBNL's Tracking the Sun dataset

QUALITY OF SERVICE

Next Steps

PSE

PSE looks forward to opportunities for continuing work with the WUTC Staff to bridge from the GRC requirements to the Equity Docket A-230217

LBNL

Determine national platform for upcoming DEA tool

Convene second DEA Advisory Group call to review pilot and first draft of tool

Conduct Public Outreach to socialize the guide and tool