WESTERN CENTRAL MOUNTAINS

ELECTRICAL PLAN

Introductions

Committee Introductions

- Name
- Organization/community you are representing
- Favorite Musical Artist

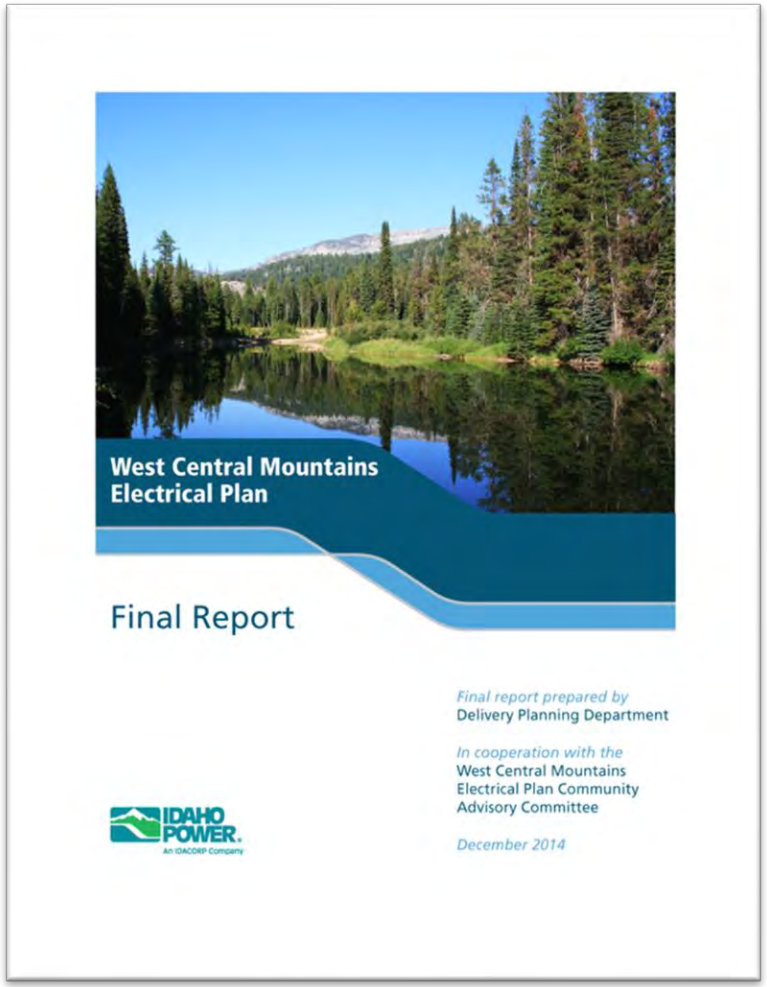
WESTERN CENTRAL MOUNTAINS

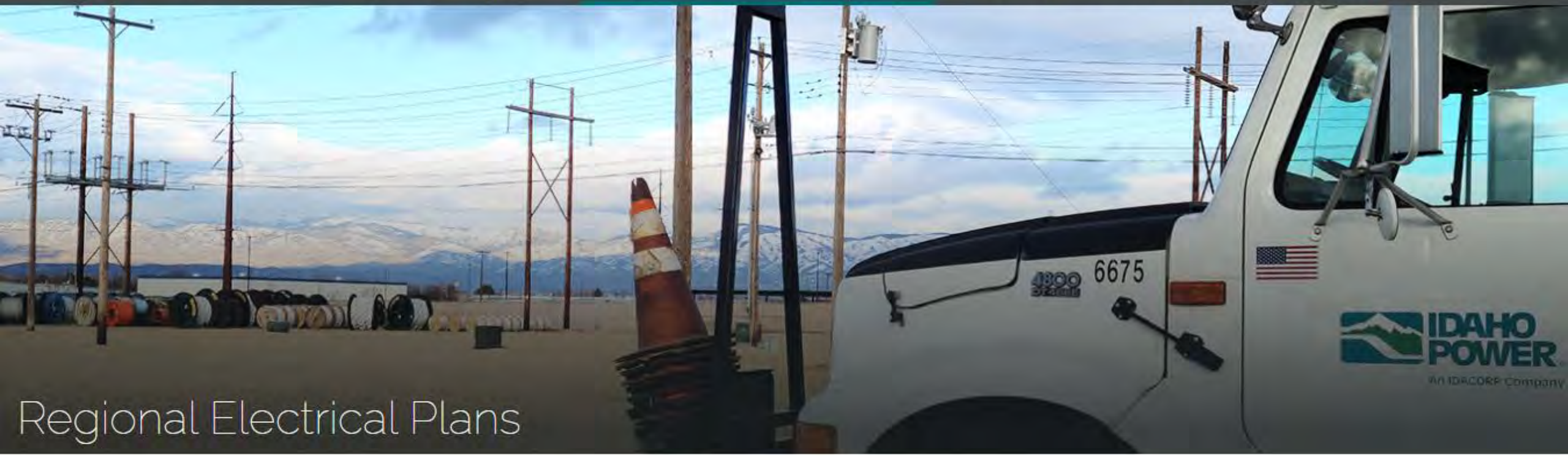
ELECTRICAL PLAN

Project Orientation

Jim Burdick
Engineering Leader
Idaho Power

2014 West Central Mountains Electrical Plan





Regional Electrical Plans

Idaho Power works with representatives of local governments and environmental agencies, business leaders, and community stakeholders to develop and periodically update Regional Electrical Plans. These plans help determine where to build new transmission lines, substations, and associated equipment to meet customers' future needs. Here are the results of those planning efforts from across our service area:

West Central Mountains Electrical Plan Final Report

Idaho Power and a Community Advisory Committee (CAC) worked together in 2013 and 2014 to address the West Central Mountains long-term electric demand.

Today's Agenda

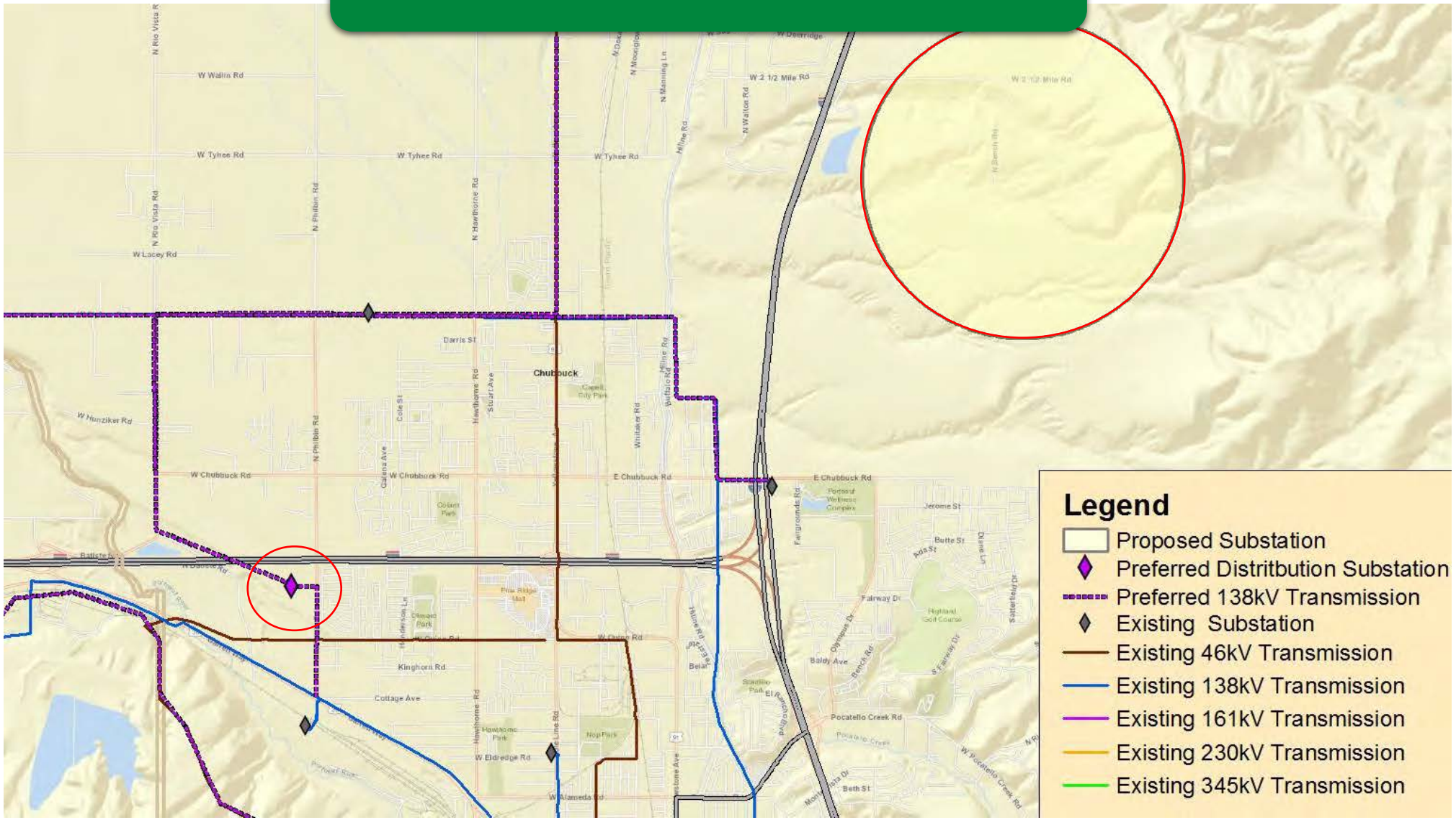
10:00 a.m.	Welcome
10:25 a.m.	Introductions
10:40 a.m.	Project orientation and committee logistics
11:05 a.m.	General power concepts
12:00 p.m.	Lunch
12:30 a.m.	2014 WCMEP review
1:00 p.m.	Current conditions
1:15 p.m.	Community goals and siting criteria
1:45 p.m.	Next steps and wrap up
2:00 p.m.	Adjourn

Purpose

Update Guiding Principles and Siting Criteria

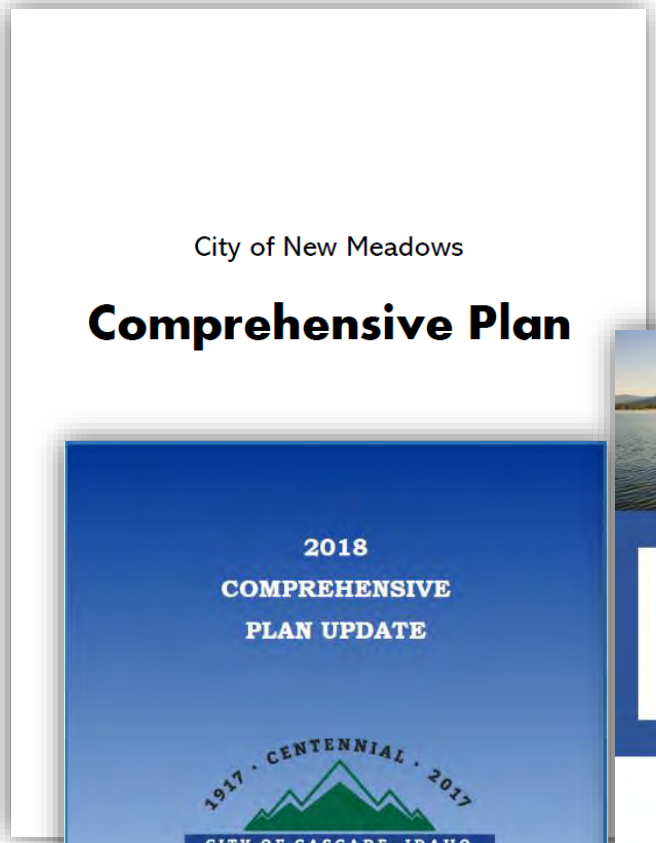
Purpose

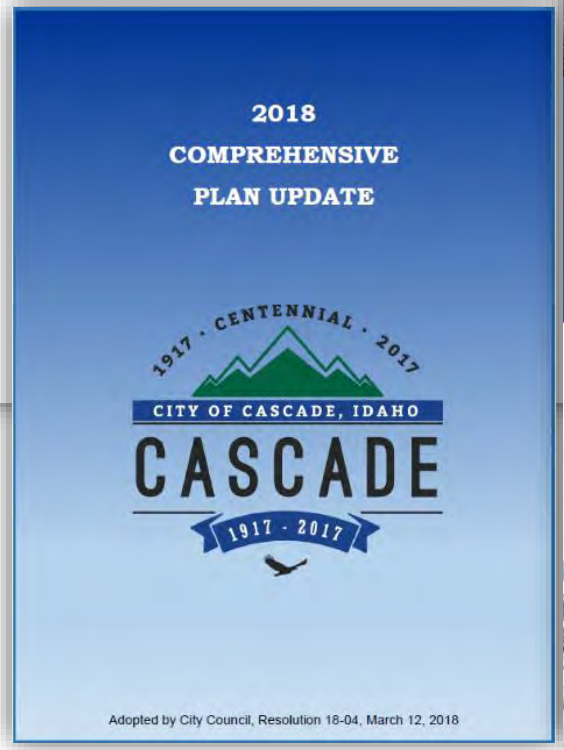
Update the Electrical Plan

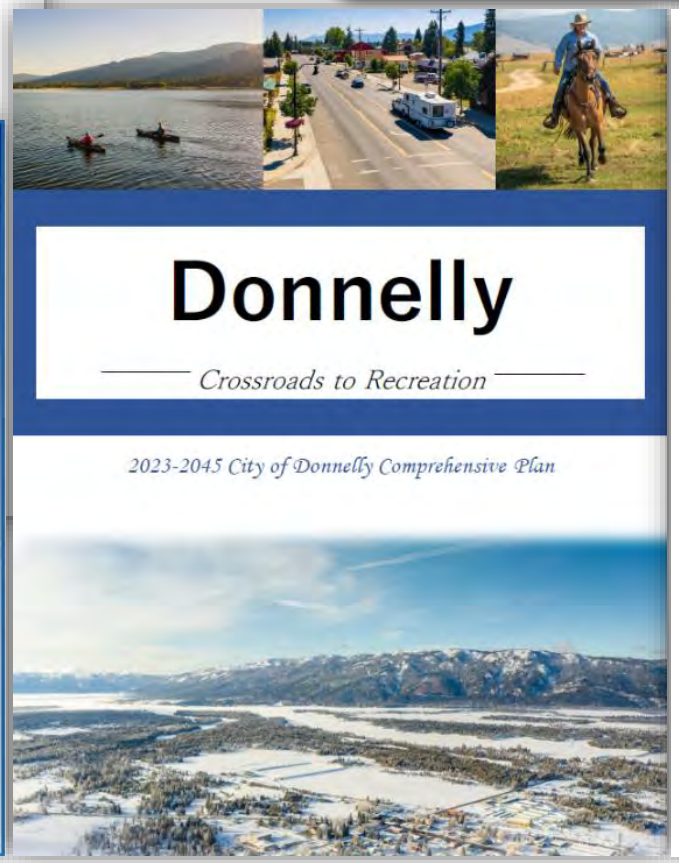


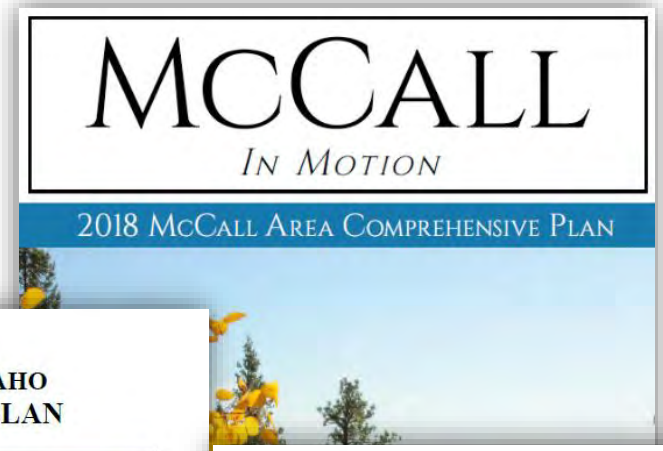
Purpose

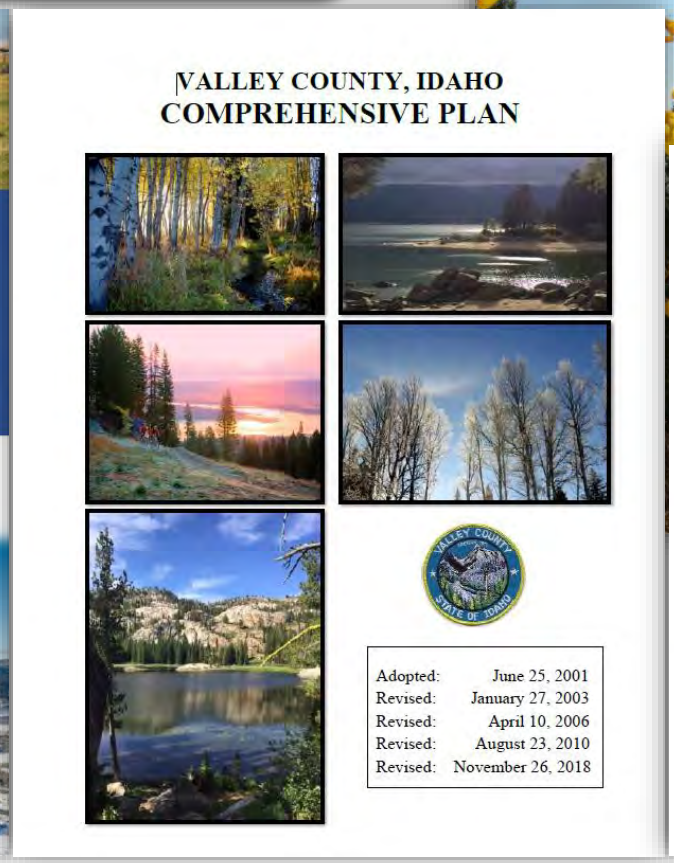
Comprehensive Plan Integration

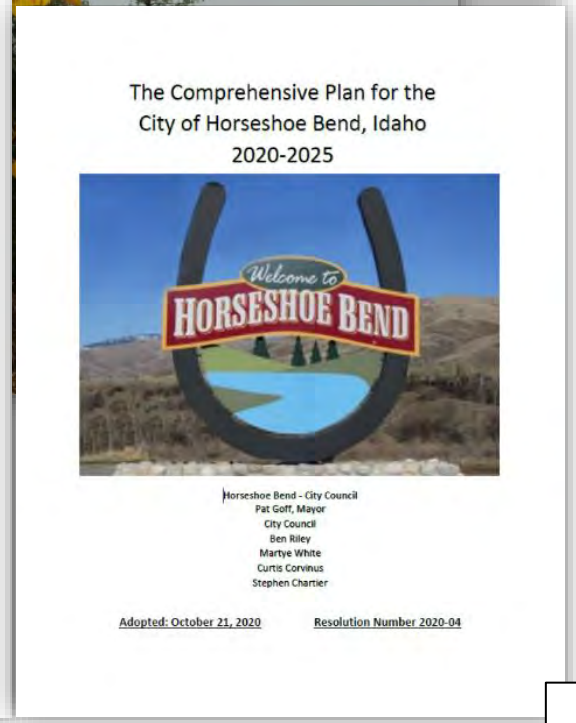












Perspective

Meetings Outline

September:
1. Generation, substations, and transmission overview, WCMEP review, community goals and siting criteria review
2. Goals and siting criteria alignment, small-group mapping
3. *Tentative - more time for small-group mapping*

November:
1. Mapping consolidation
2. *Tentative – more time for mapping consolidation*

March:
1. Review draft update, discuss comprehensive plan integration

Adverse Weather

WESTERN CENTRAL MOUNTAINS
ELECTRICAL PLAN

General Power Concepts

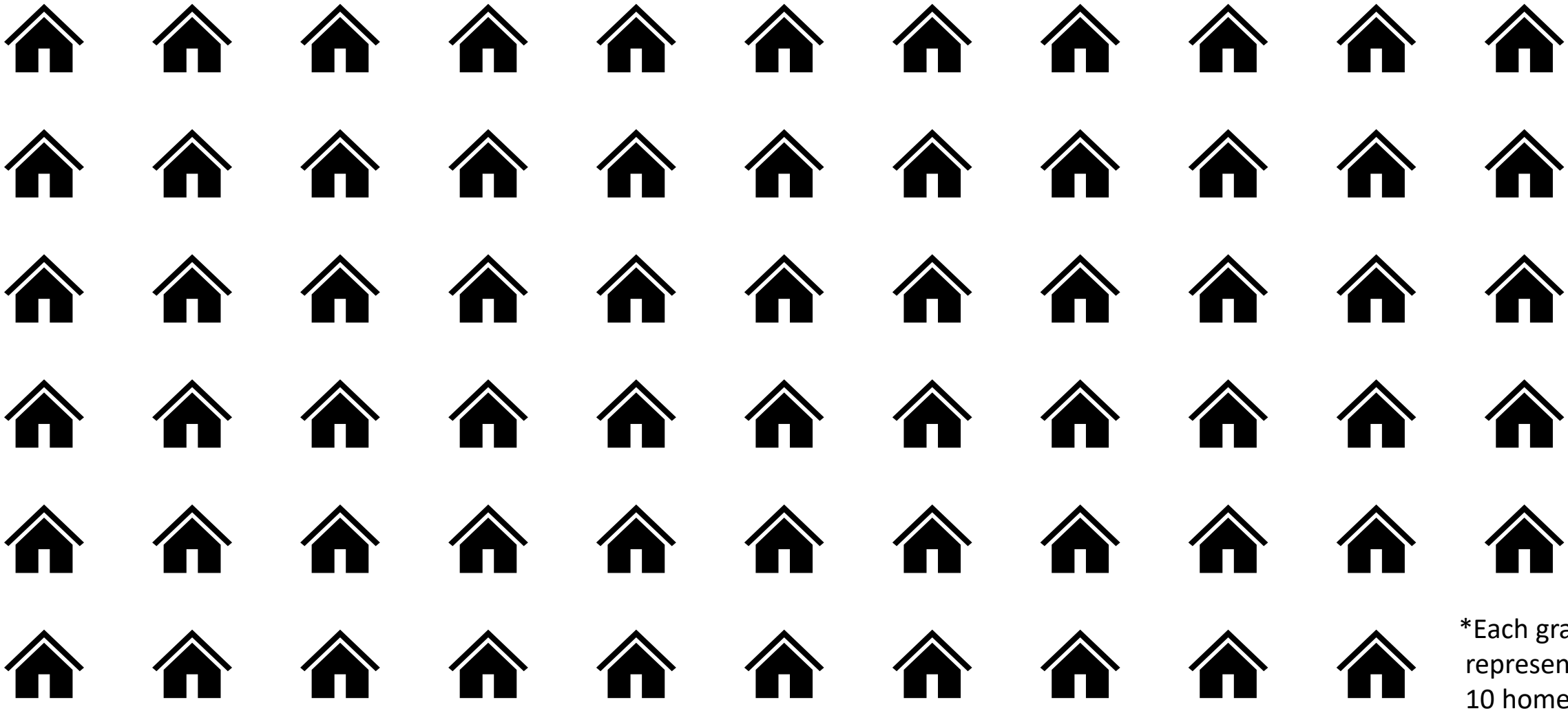
Jordan Scott
Senior Engineer
Idaho Power

Power

The rate at which work is performed.

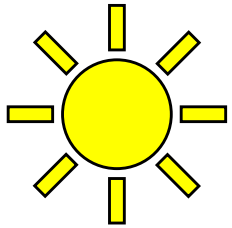
Unit: Megawatt (MW)

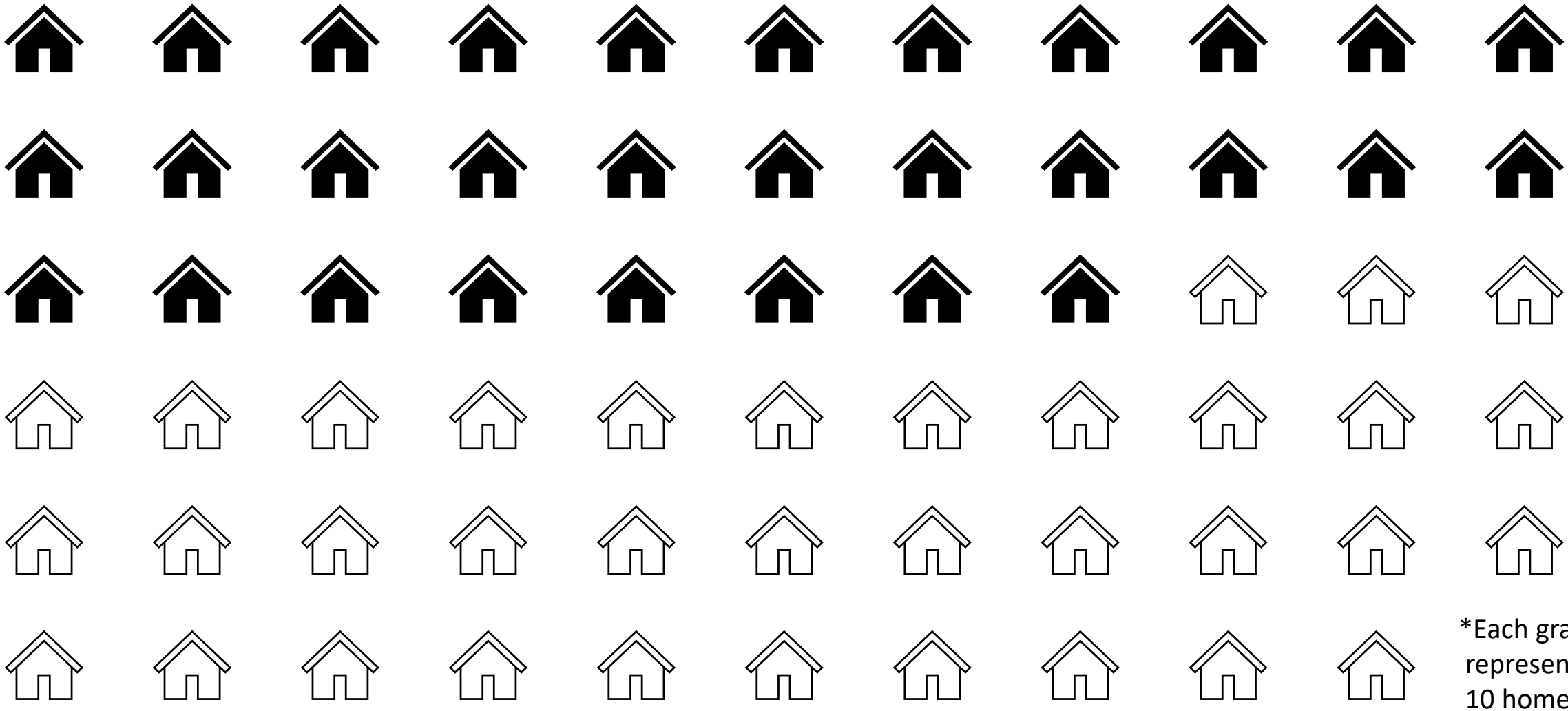
1MW Visualized



*Each graphic represents 10 homes

1MW Visualized





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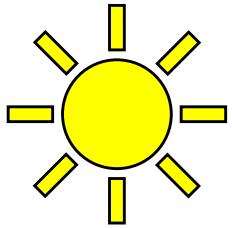
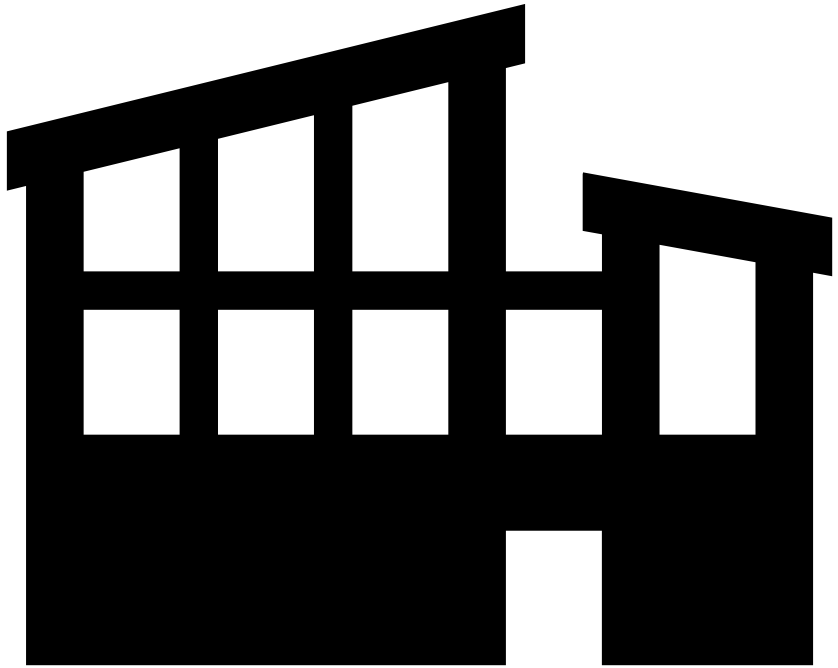
1 MW Visualized



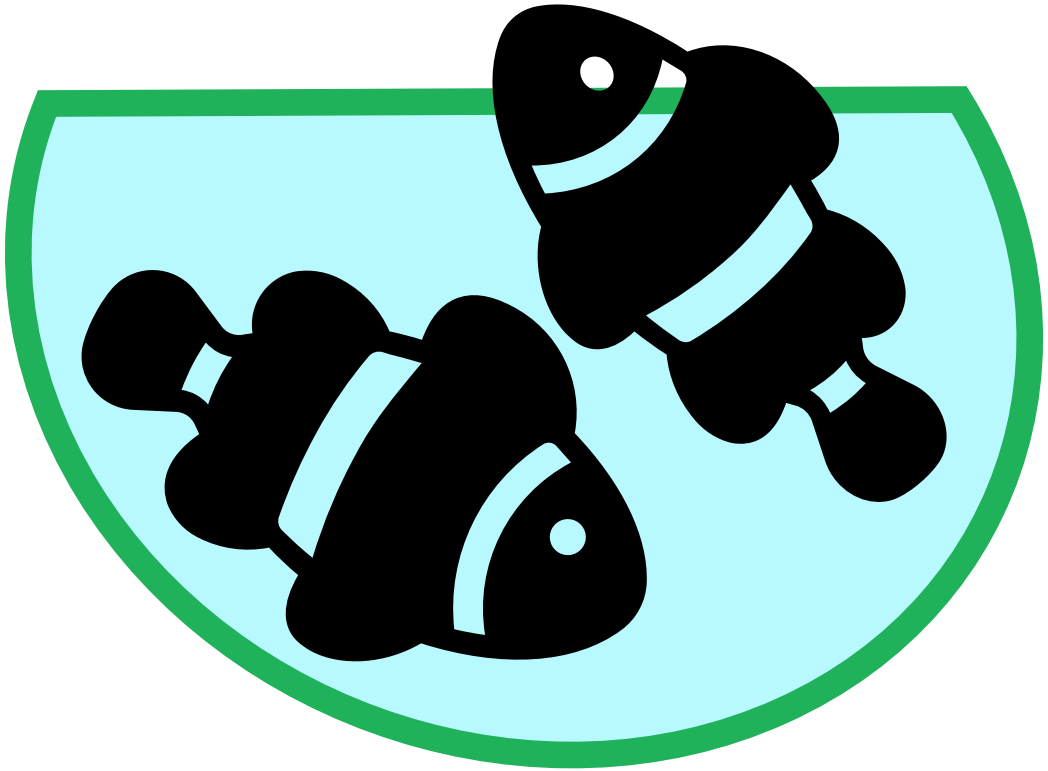


Capacity

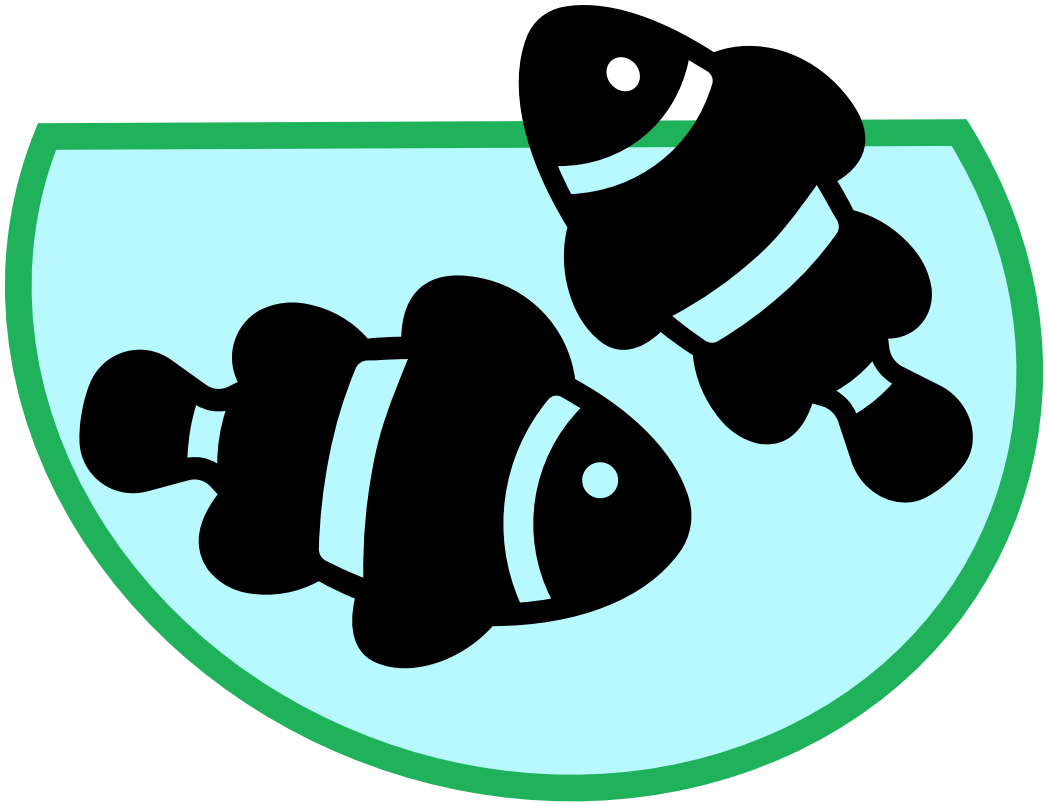
The amount of power an element can handle

- The unit is the same as it is for power (MW)

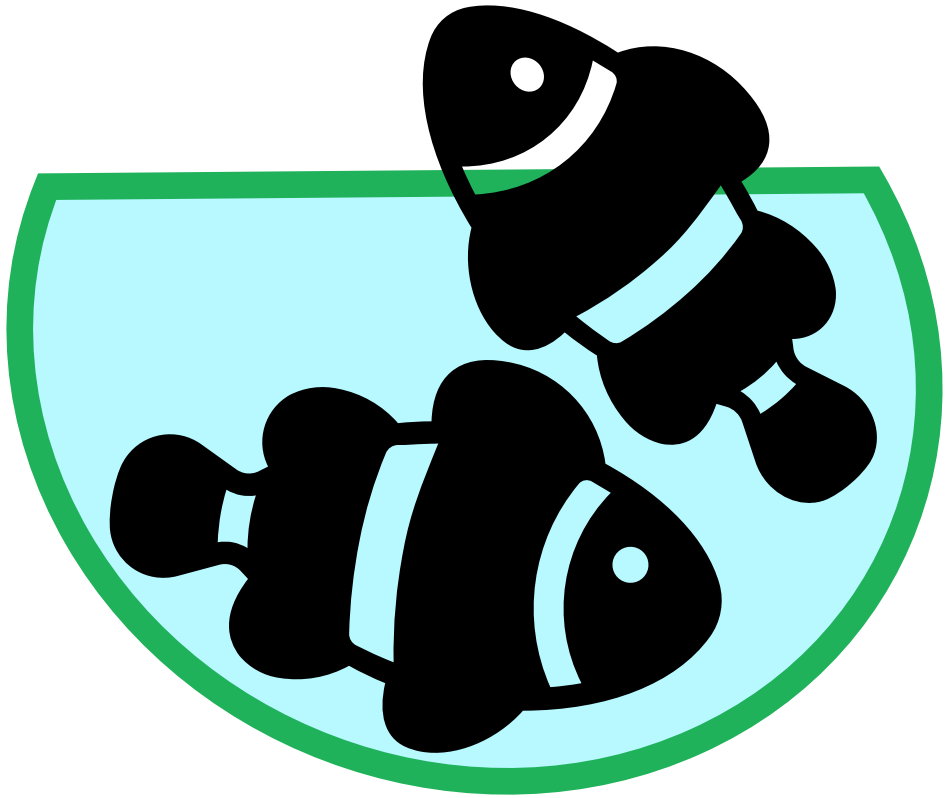
Capacity Visualized
Energy Efficiency

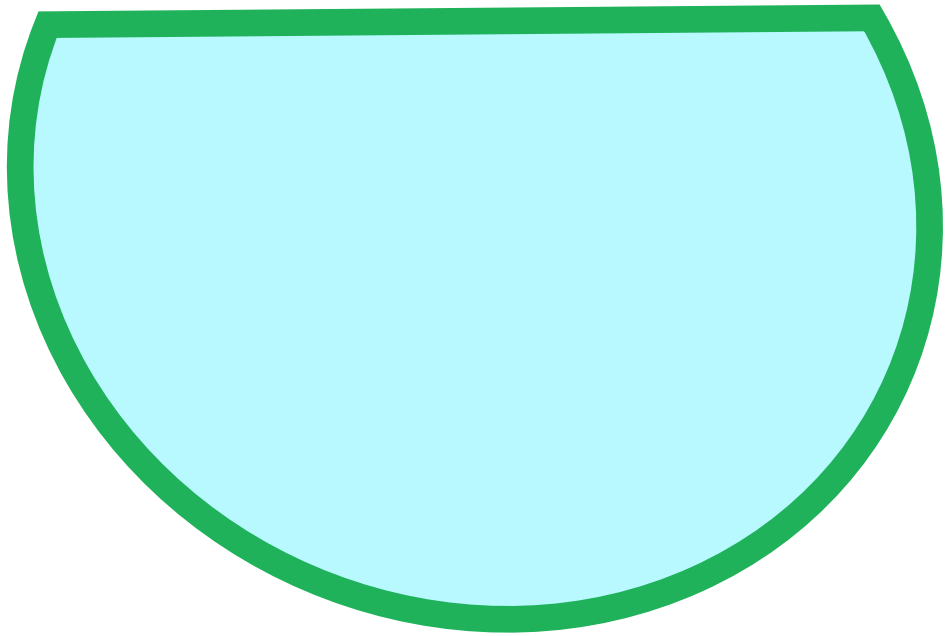


Capacity Visualized
Upgrade Existing Infrastructure



Capacity Visualized
Construct New Infrastructure



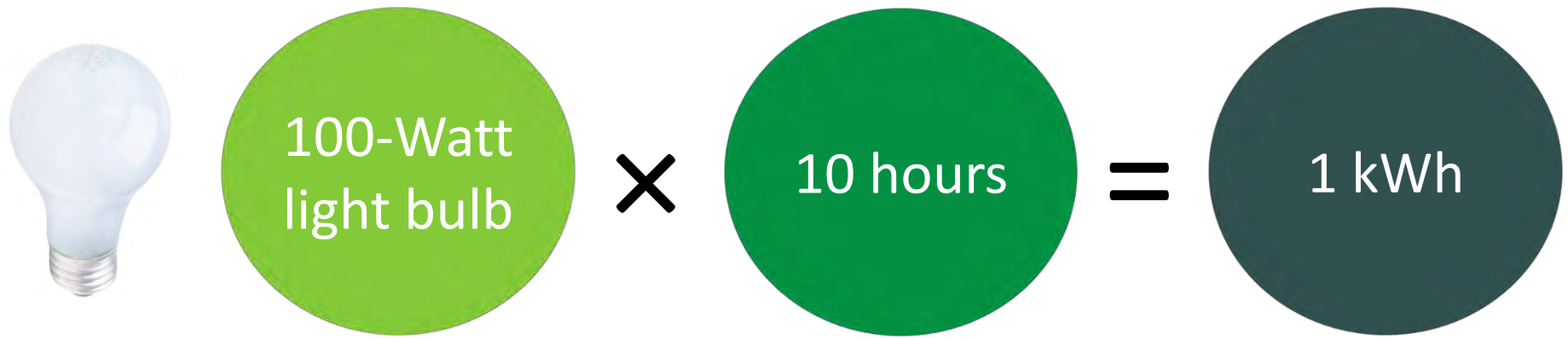


Capacity

Energy

The amount of power used in a given period:

- kilowatt-hour (kWh) = unit of measure for electrical energy



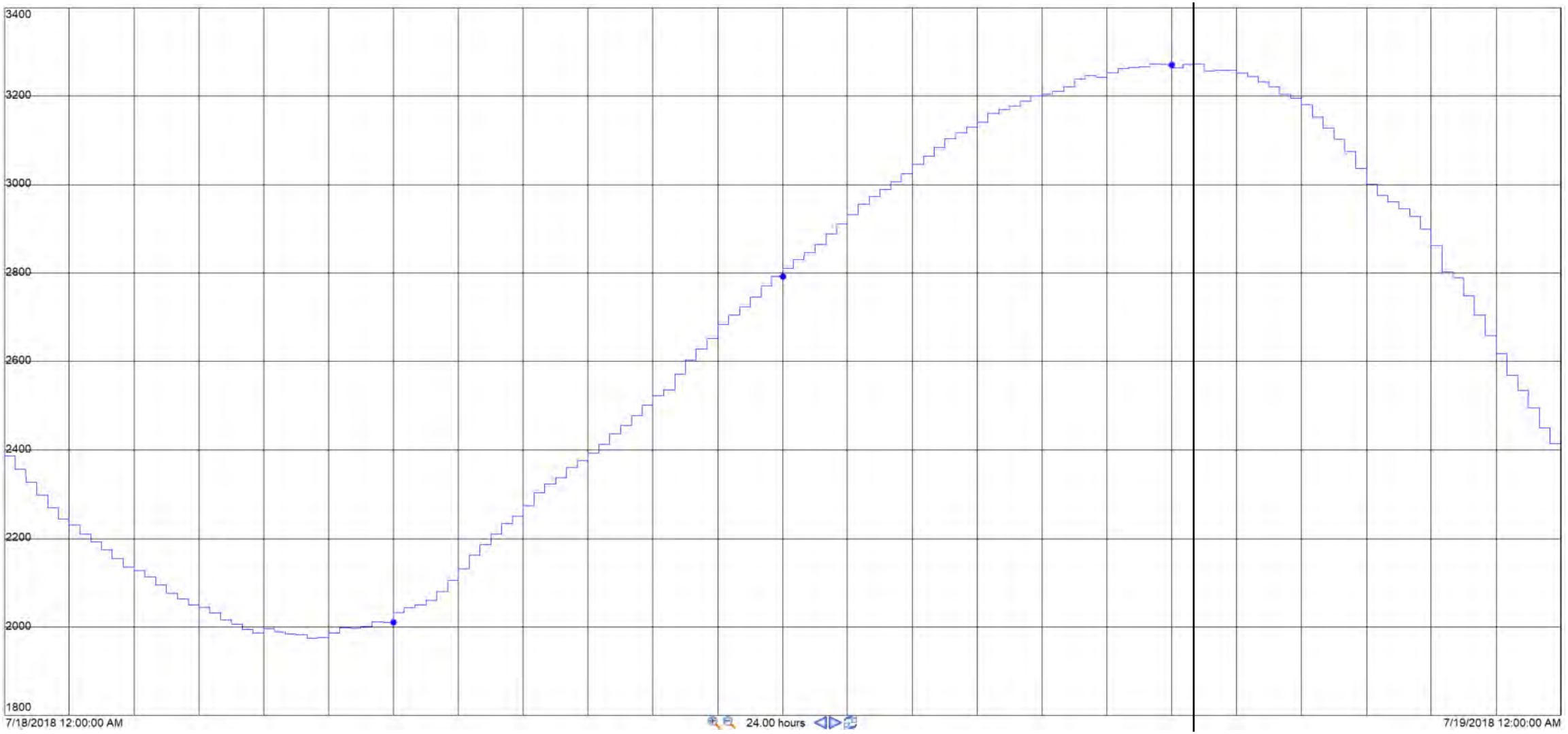
Energy vs Capacity Analogy

- Capacity: 2 vehicles at a time

- Energy: 1,000 vehicles pass the line in an hour

Demand (Load)

Peak Demand



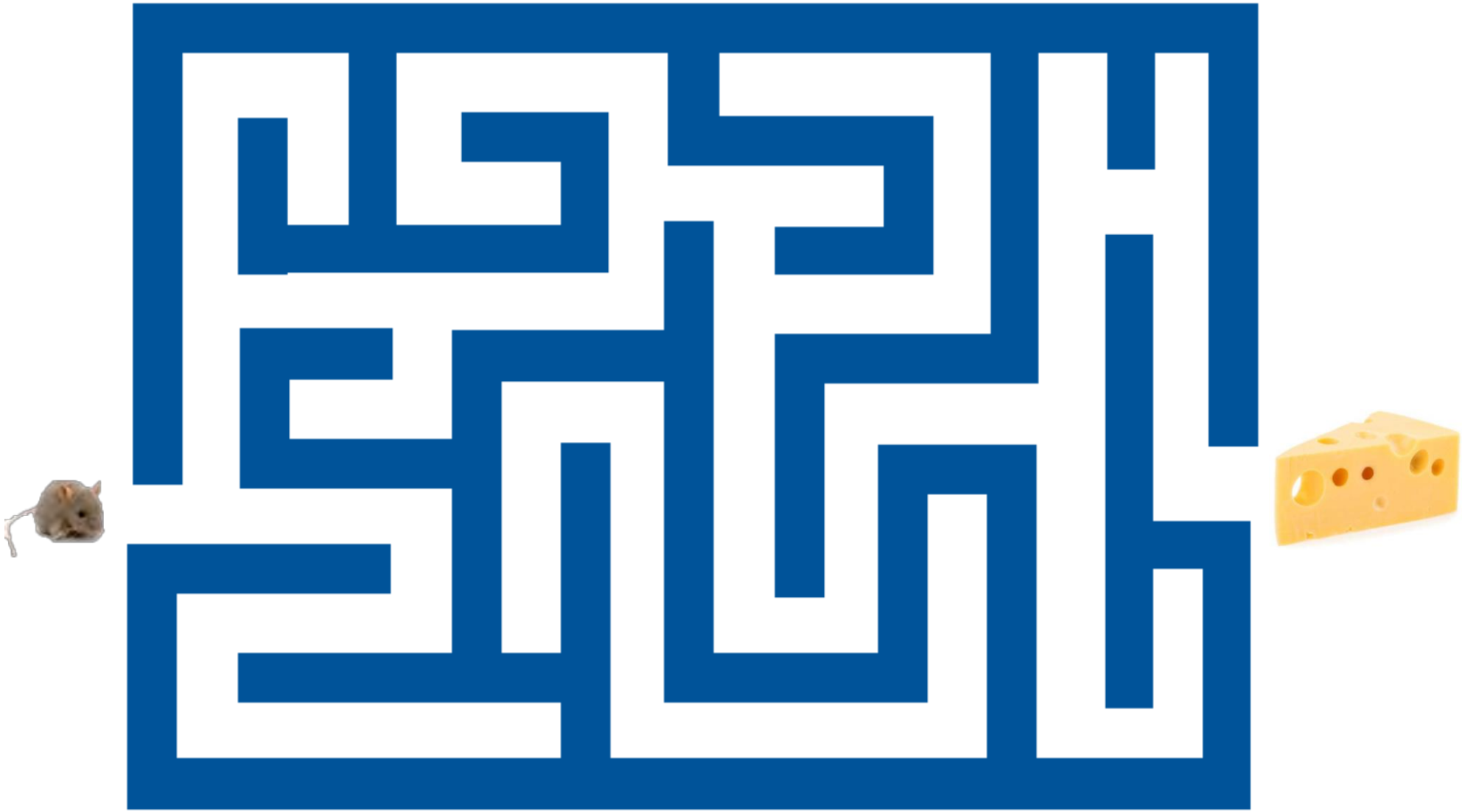
Typical Units for Power Delivery

	Base Unit	Typical Unit
Voltage	Volt (V)	kilovolt (kV)*

kilo = 1,000

mega = 1,000,000

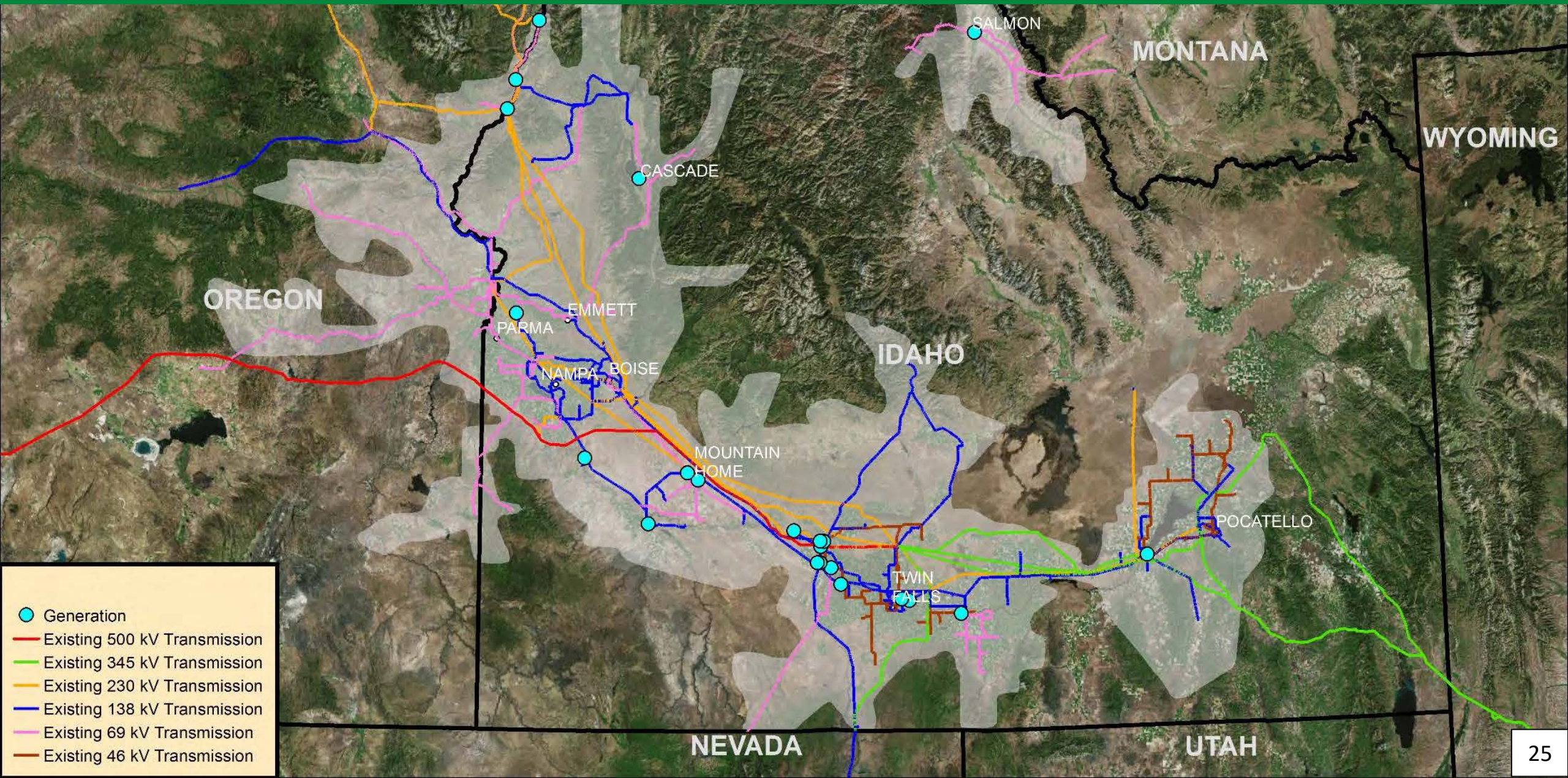
Power Flow



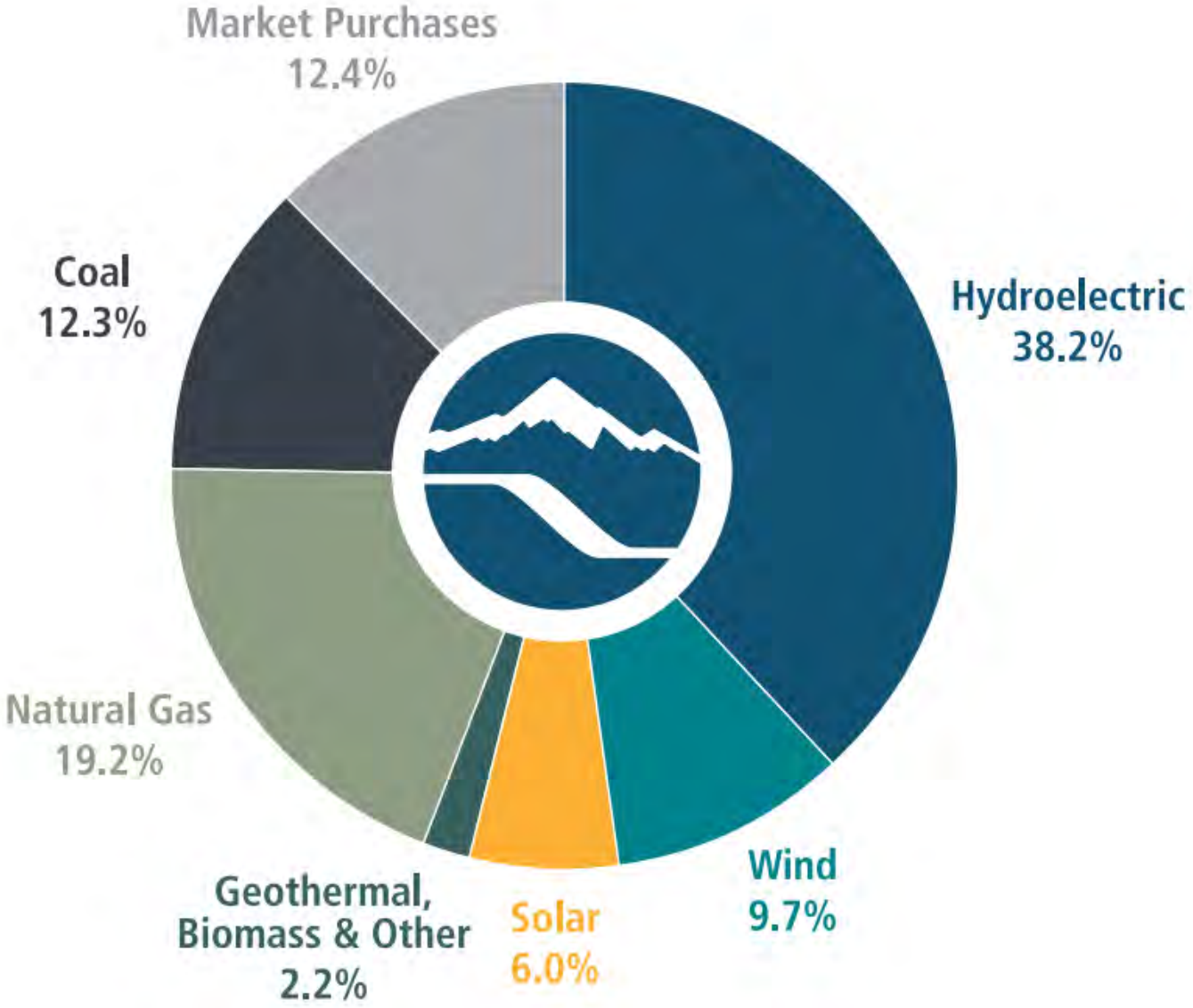
1

Generation Plant

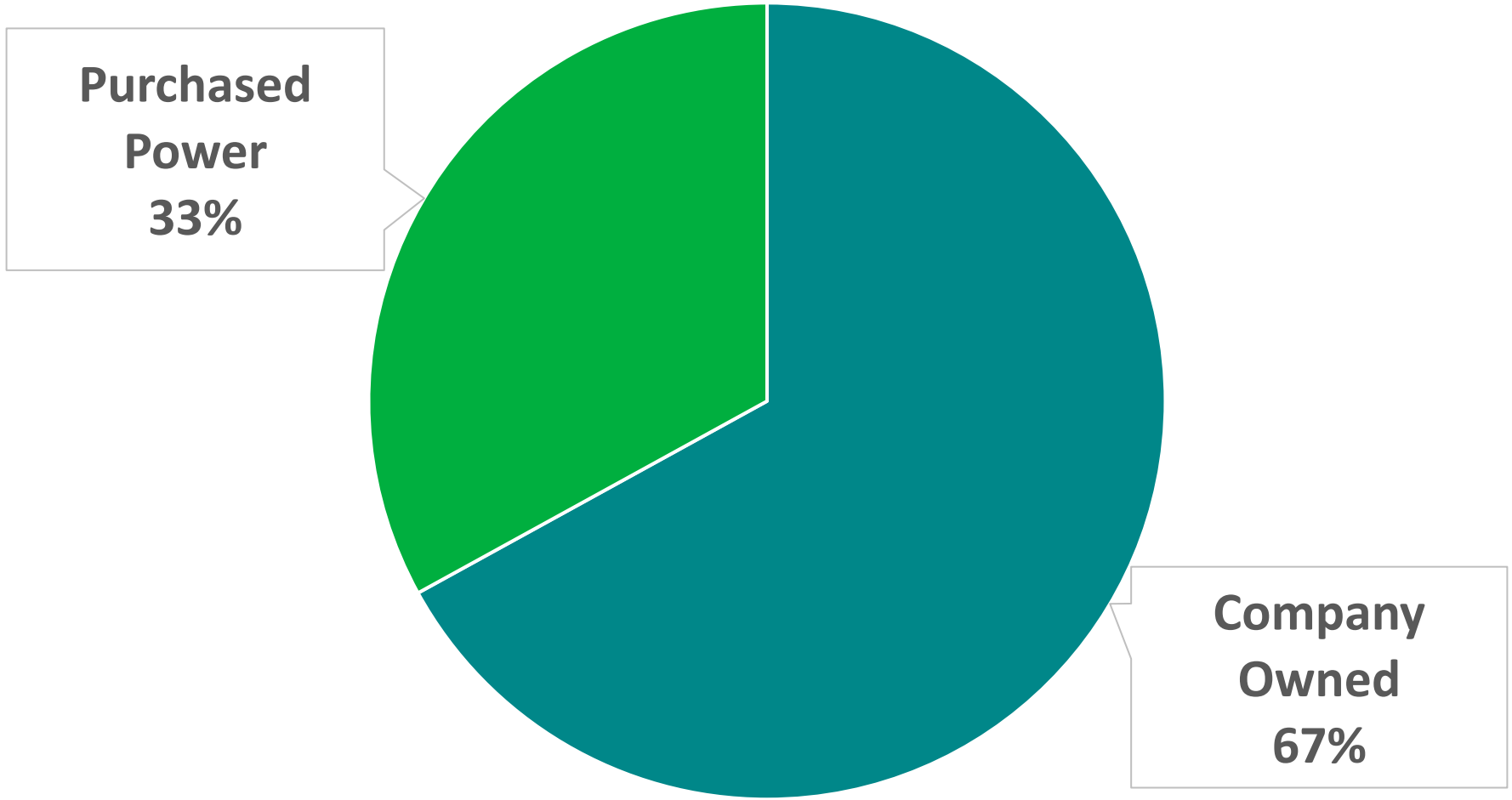
Idaho Power System Overview



2024 Generation Profile



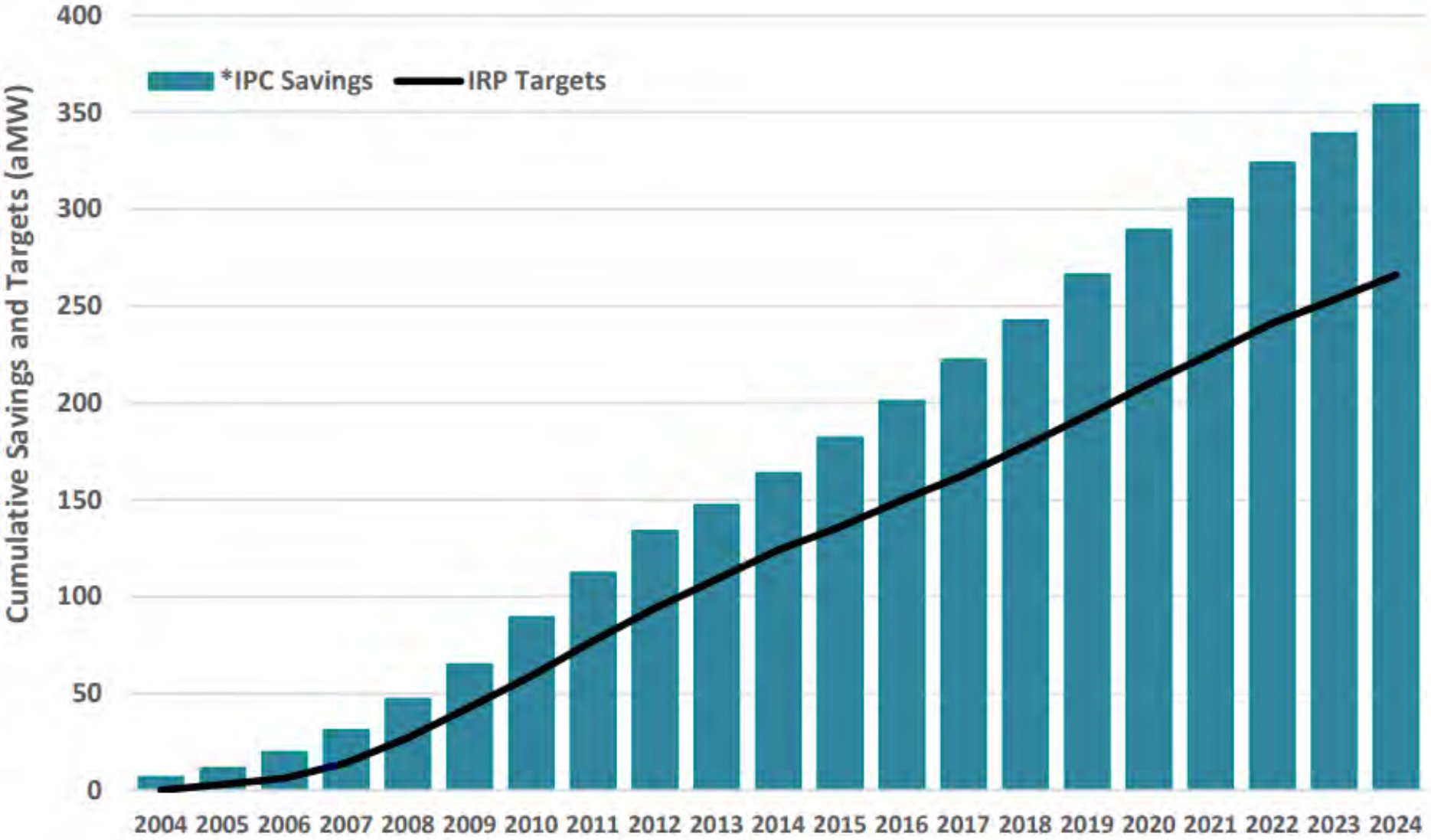
2024 Generation Profile



Energy Efficiency

Energy Efficiency

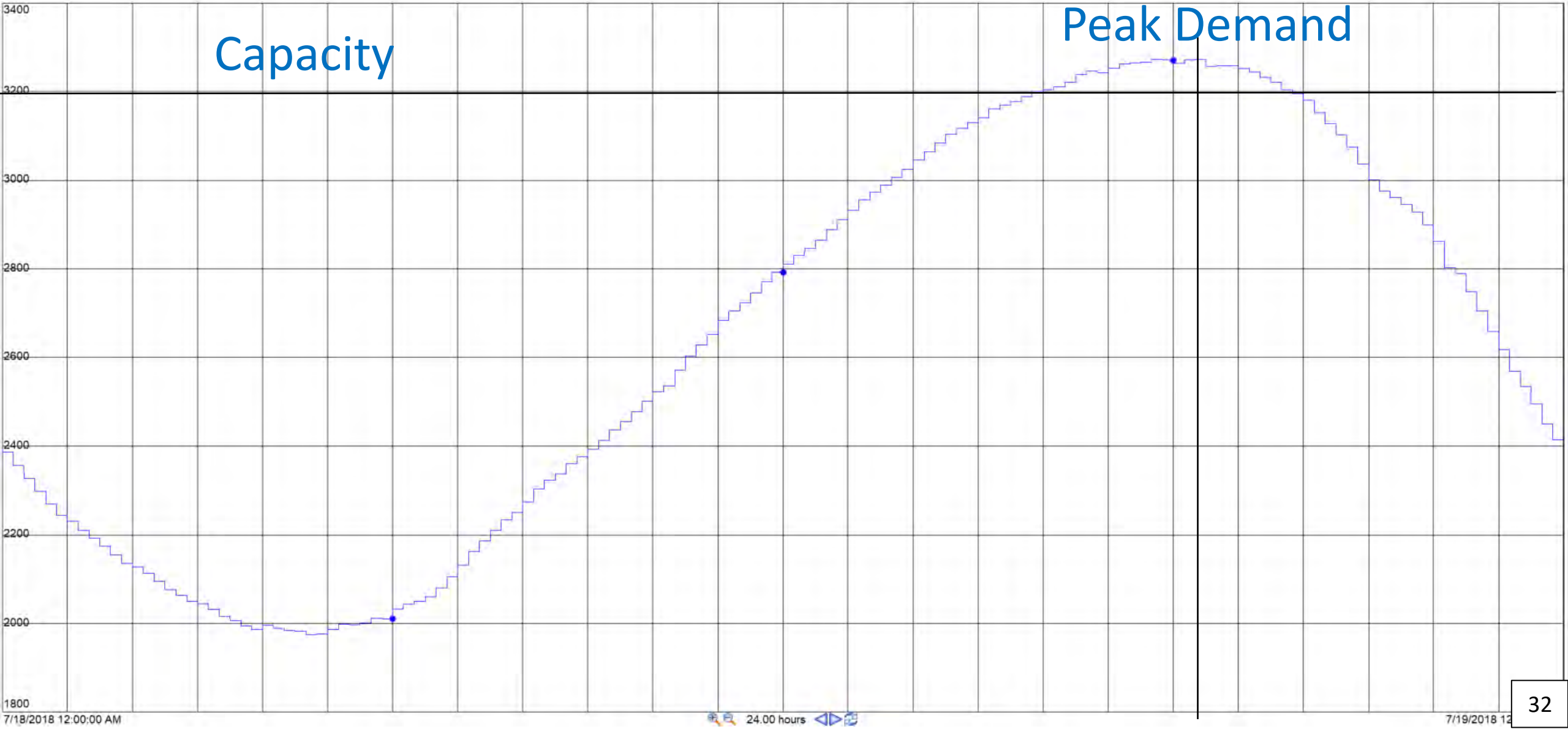
Energy Efficiency



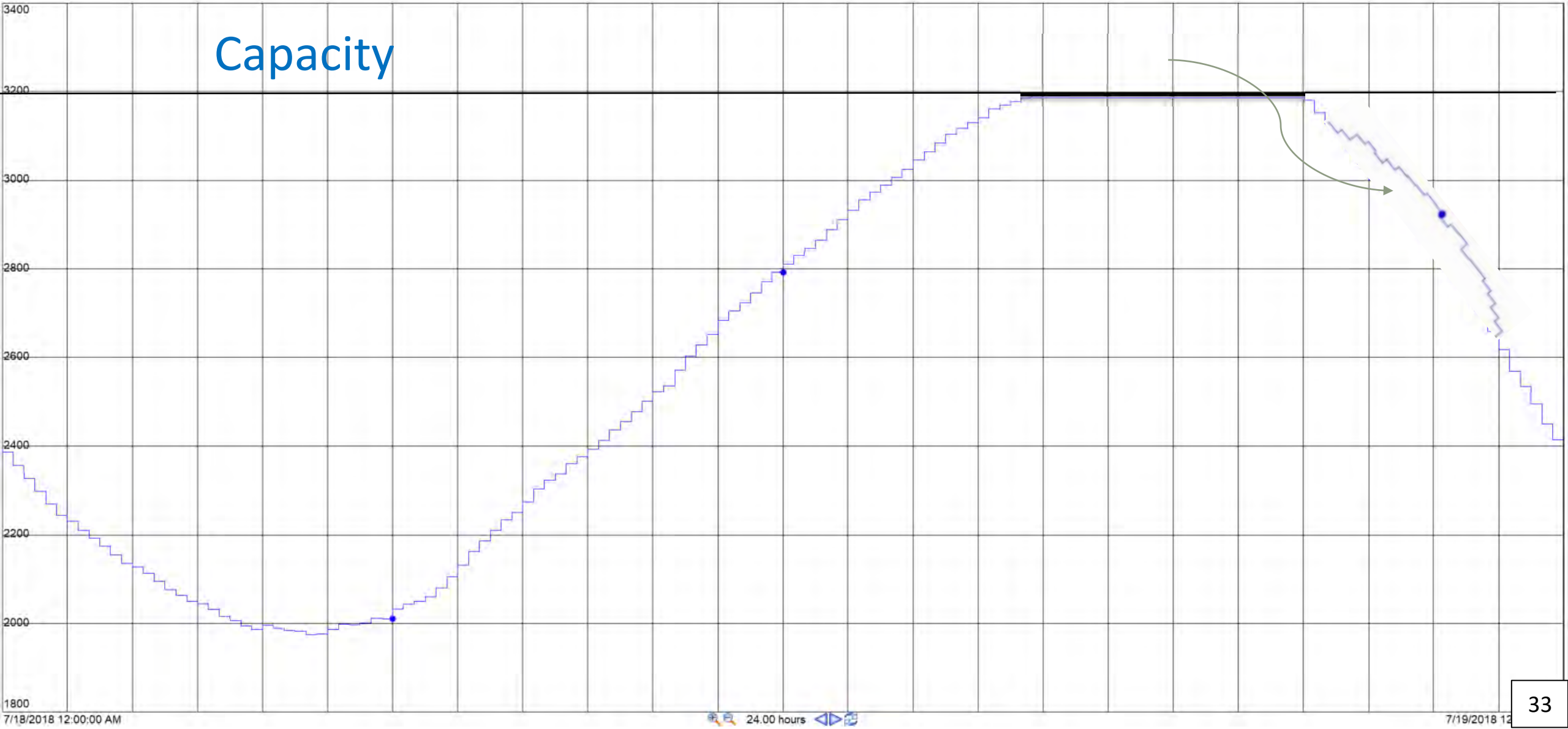
*IPC Savings include Northwest Energy Efficiency Alliance non-code/federal standards savings

Figure 6.1 Cumulative annual growth in energy efficiency compared with IRP targets

Demand Response (DR)



Demand Response (DR)



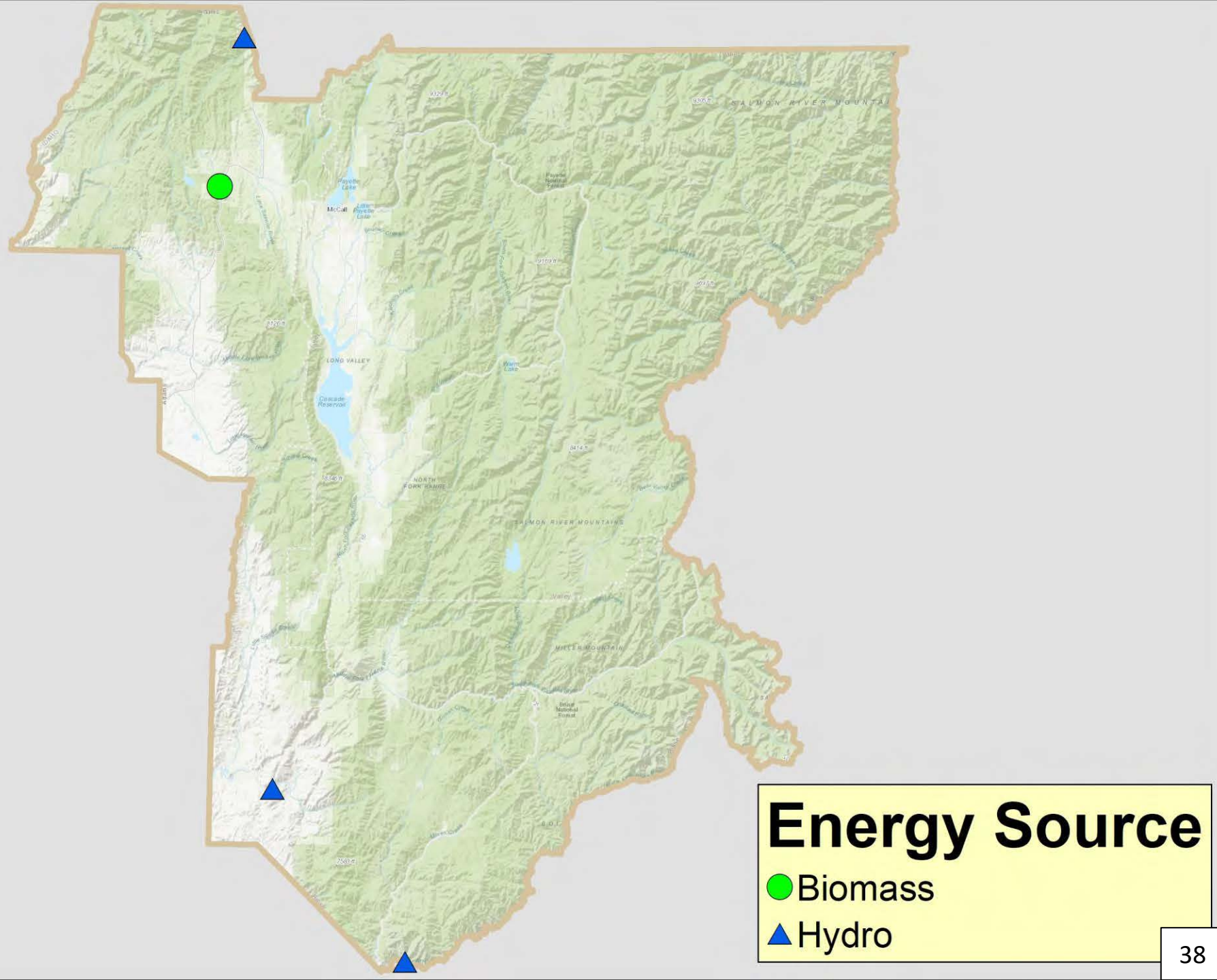
Demand Response

Demand Response

Demand Response

Distributed Energy Resources (DER)

WCMEP Customer owned DER Map



Market Purchases

High demand, high cost

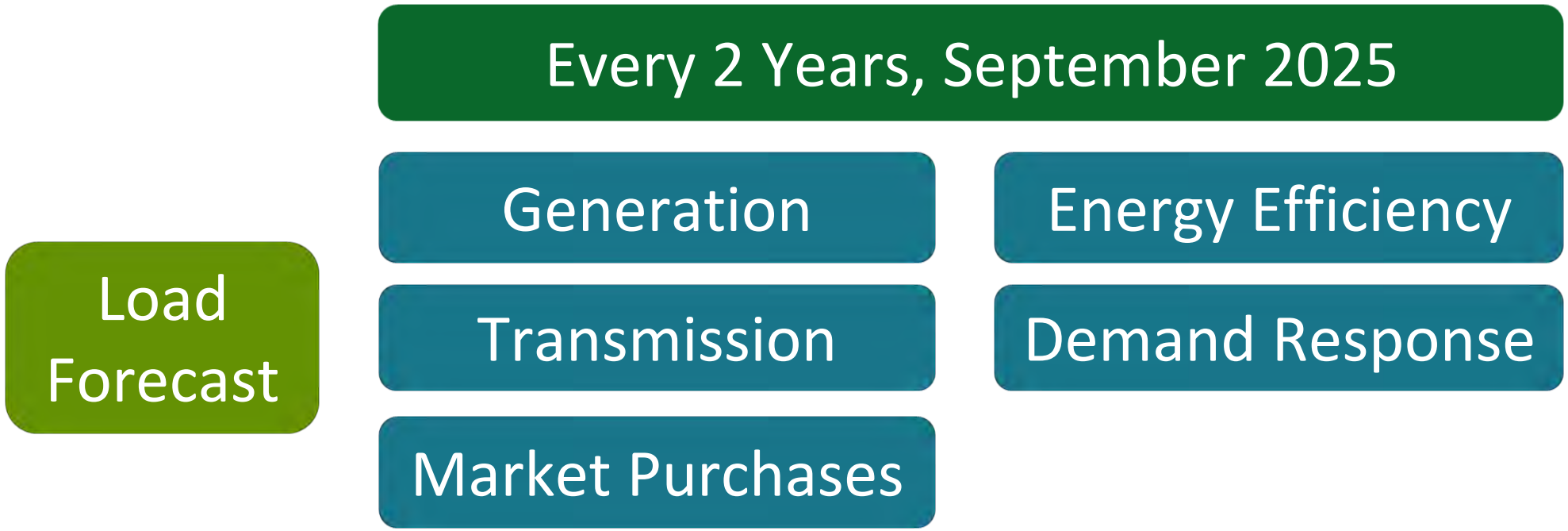
12.4% in 2024

Low demand, low cost

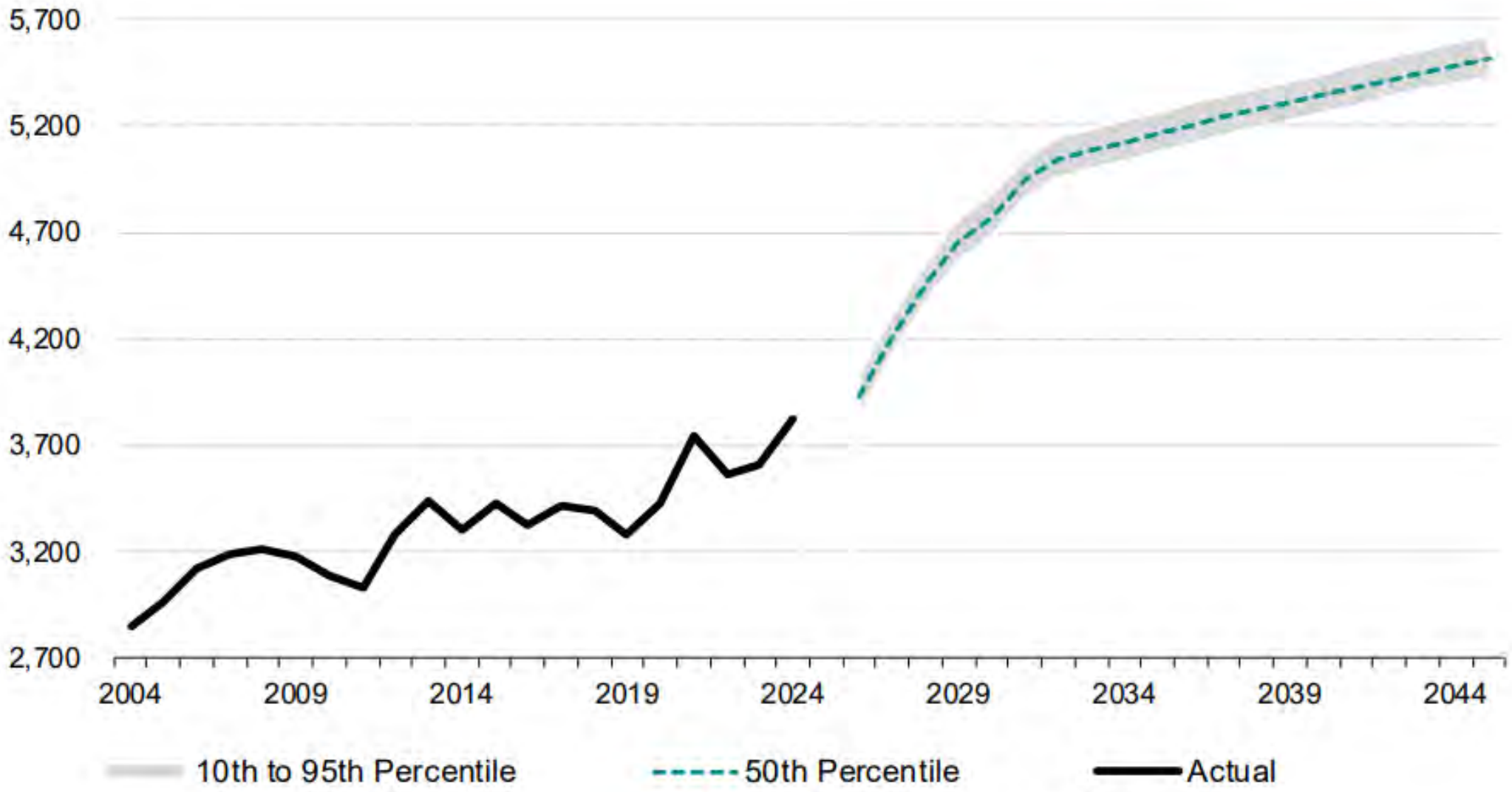
Long-Term Plans

www.idahopower.com

Integrated Resource Plan (IRP)

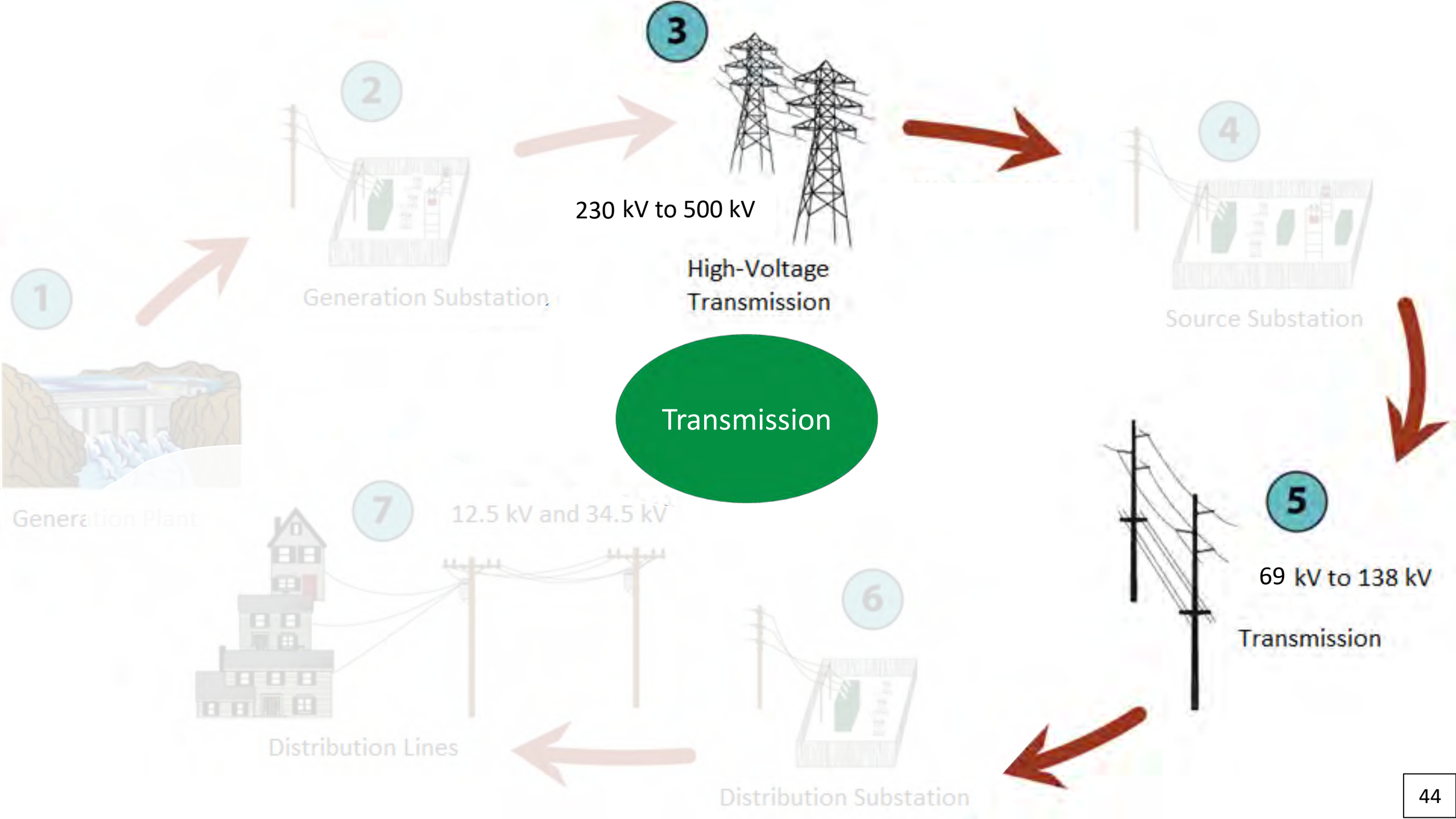


Forecasted Demand

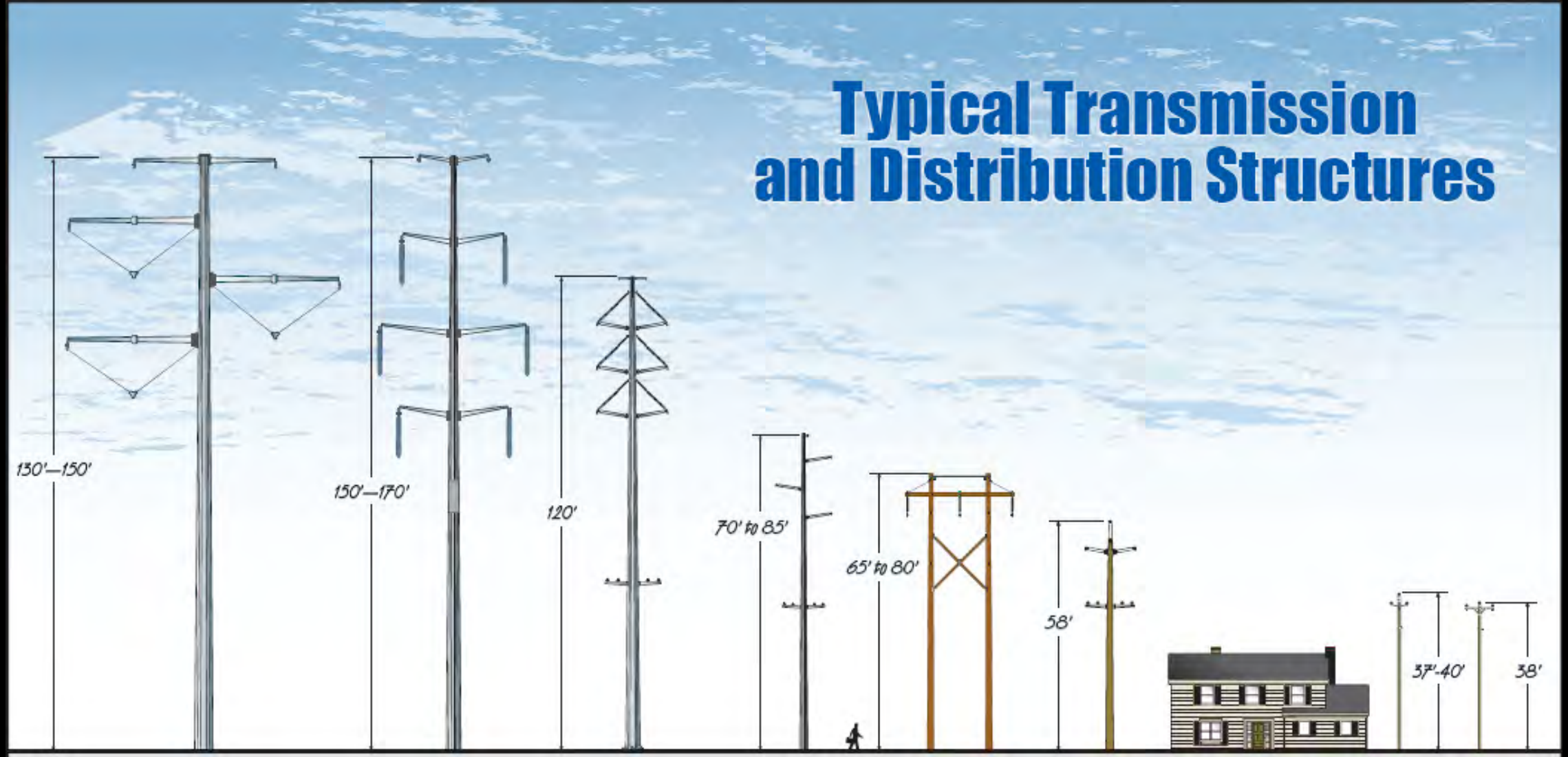


Integrated Resource Plan (IRP)

Year	Coal Exits	Conv. Gas	New Gas	H2	Wind	Solar	4Hr	8Hr	Pumped Storage	100Hr	Trans.	Geo	Nuclear	DR	EE Forecast	EE Bundles
2026	-134	261	0	0	0	125	250	0	0	0	0	0	0	0	18	0
2027	0	0	0	0	600	420	100	0	0	0	0	0	0	0	14	0
2028	0	0	0	0	0	100	200	0	0	0	B2H	0	0	0	15	0
2029	0	0	150	0	100	0	155	0	0	0	SWIP-N	0	0	10	16	0
2030	-350	350	300	0	0	100	0	0	0	0	0	0	0	0	16	0
2031	0	0	0	0	0	400	0	0	0	0	0	0	0	0	17	8
2032	0	0	0	0	0	200	0	0	0	0	0	0	0	0	17	0
2033	0	0	0	0	0	100	50	0	0	0	0	0	0	0	17	21
2034	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	6
2035	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	5
2036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	5
2037	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0
2038	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0
2039	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0
2040	0	0	0	0	0	0	5	0	0	0	0	0	0	0	12	0
2041	0	0	50	0	0	0	5	0	0	0	0	0	0	0	12	0
2042	0	0	0	0	0	0	5	0	0	0	0	0	0	10	11	3
2043	0	0	50	0	0	0	5	0	0	0	0	0	0	0	11	0
2044	0	0	0	0	0	0	55	0	0	0	0	0	0	0	11	7
2045	0	0	0	0	0	0	5	0	0	50	0	0	0	0	8	2


3
230 kV to 500 kV
High-Voltage
Transmission
Transmission
5
69 kV to 138 kV
Transmission

Typical Transmission and Distribution Structures



SINGLE-CIRCUIT 500 kV STEEL POLE STRUCTURE

DOUBLE-CIRCUIT 345 kV STEEL POLE STRUCTURE

DOUBLE-CIRCUIT 230 kV STEEL POLE STRUCTURE

SINGLE-CIRCUIT 138 kV WOOD or STEEL POLE STRUCTURE AT 300' SPACING

SINGLE-CIRCUIT 138 kV H-FRAME STRUCTURE AT 600' SPACING

SINGLE-CIRCUIT 69 kV WOOD POLE STRUCTURE

TWO-STORY HOUSE

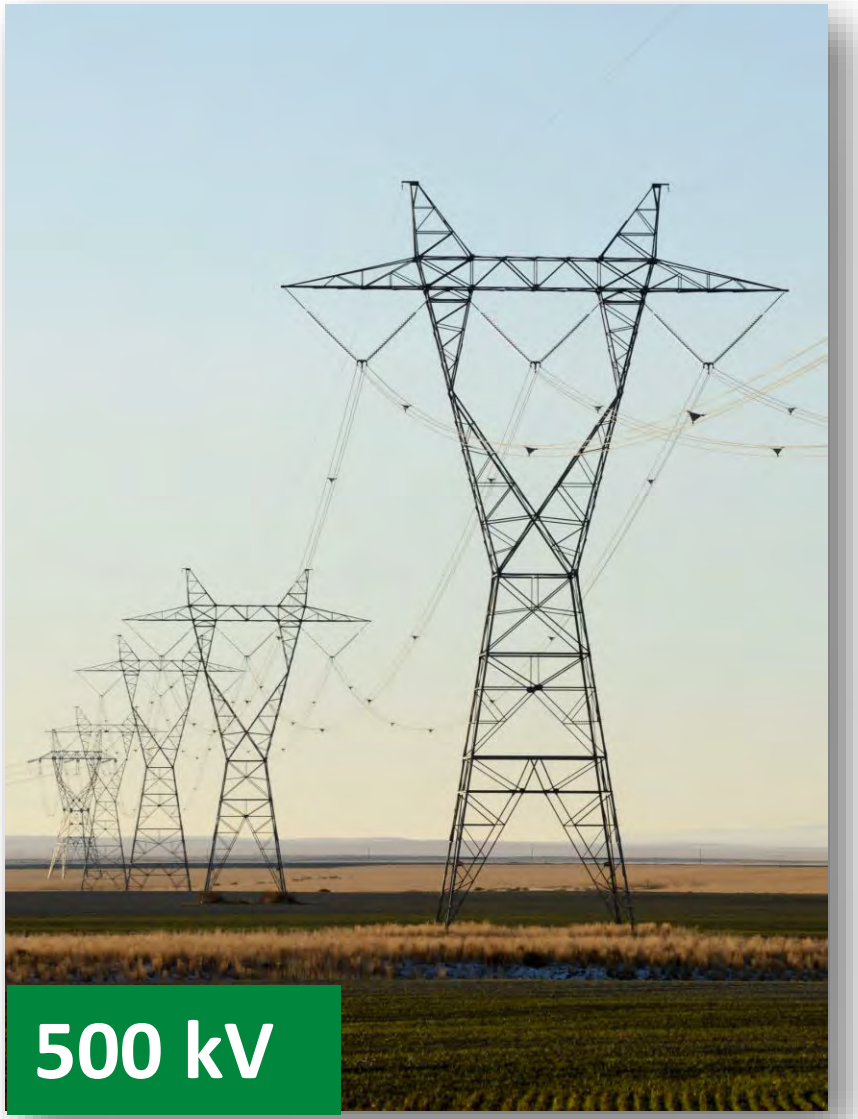
SINGLE-CIRCUIT 12 kV or 34.5 kV WOOD POLE STRUCTURES

IDAHO POWER

Transmission and Sub-Transmission Lines

Distribution Lines

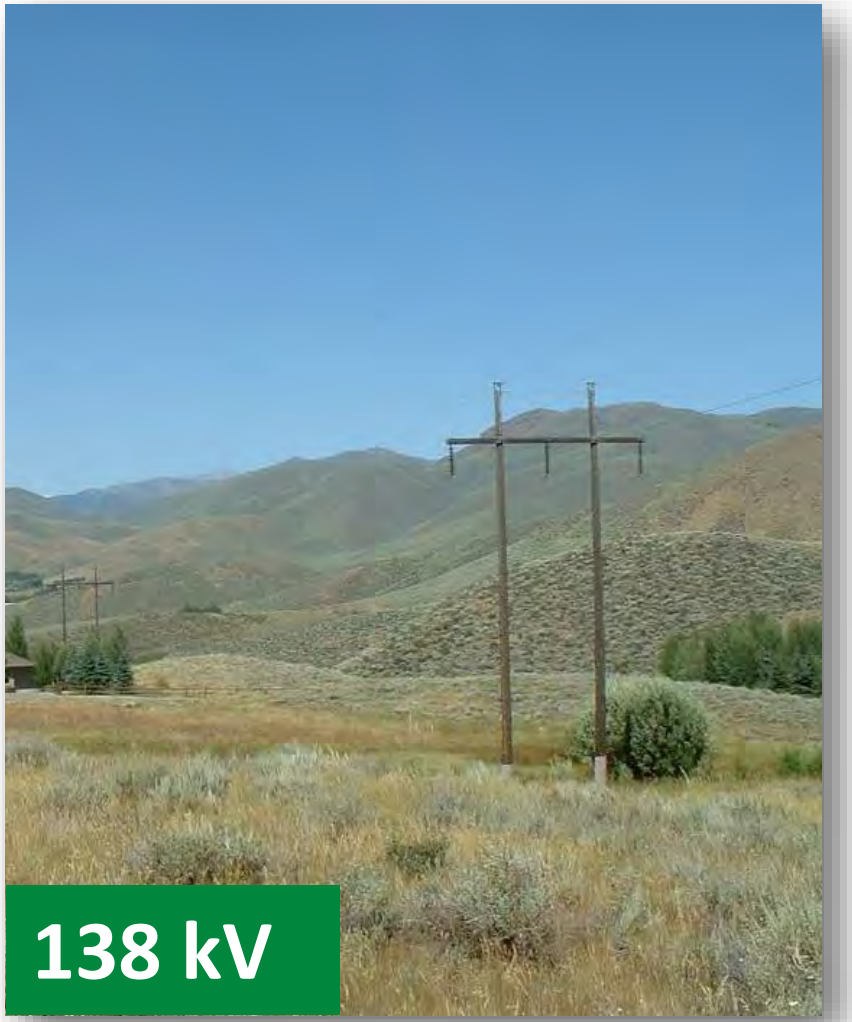
High-Voltage Transmission



230 kV - 500 kV

- Large amounts
- Long distances
- 230 kV in scope
- 500kV out of scope

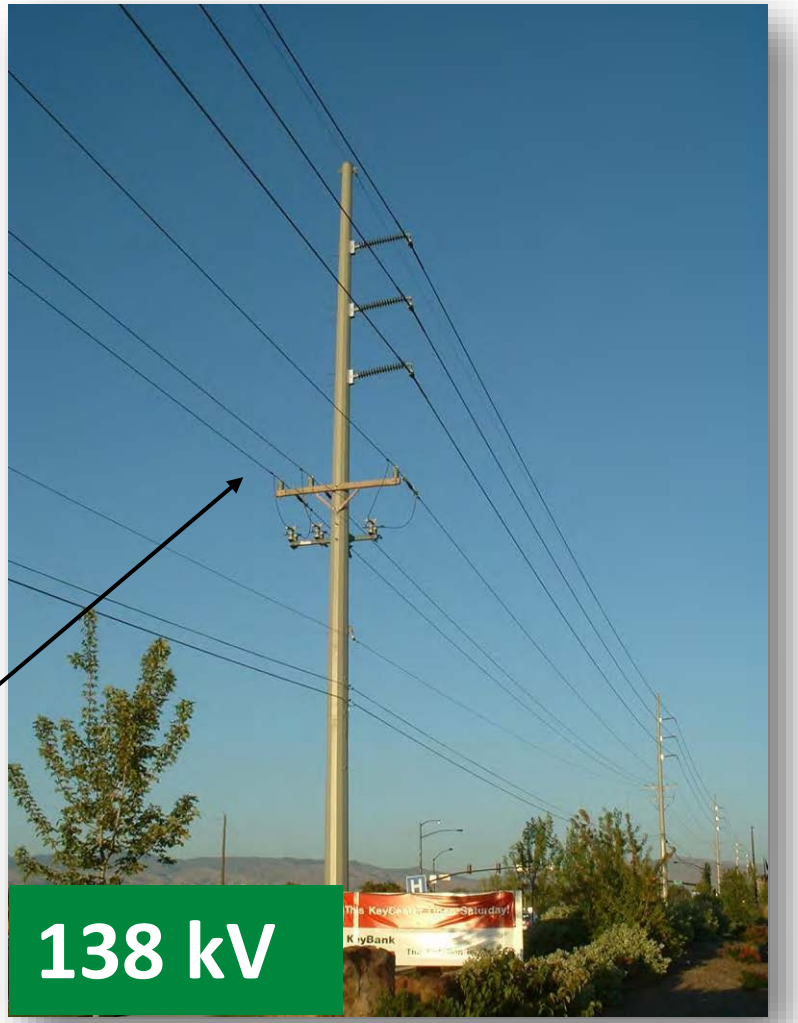
Transmission



138 kV

- Connects Distribution Substations
- In scope

Distribution line



Transmission Line Information

Voltage (kV)	Capacity (MW)	Typical Height (feet)	Cost (per mile)
500 kV	1,500	150	$5 Million – $5.5 Million
230 kV	500	100–120	$2 Million – $2.5 Million
138 kV	200	65–85	$1 Million – $1.5 Million
69 kV	70	58	$400k - $500k

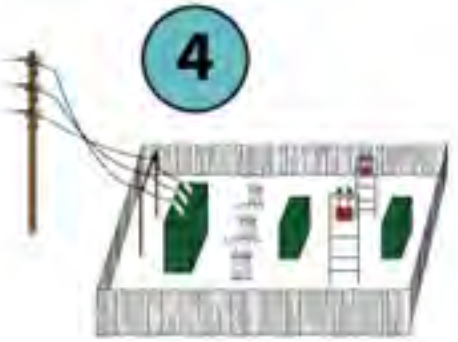
Substations

Generation Plant

Generation Substation

230 kV to 500 kV

High-Voltage Transmission



Source Substation

69 kV to 138 kV Transmission

Distribution Substation

12.5 kV and 34.5 kV

Distribution Lines

Substation

Transformer

Circuit Breaker

Source Substation

- Converts high-voltage to lower voltage transmission
- 5–10 acres

Distribution Substation

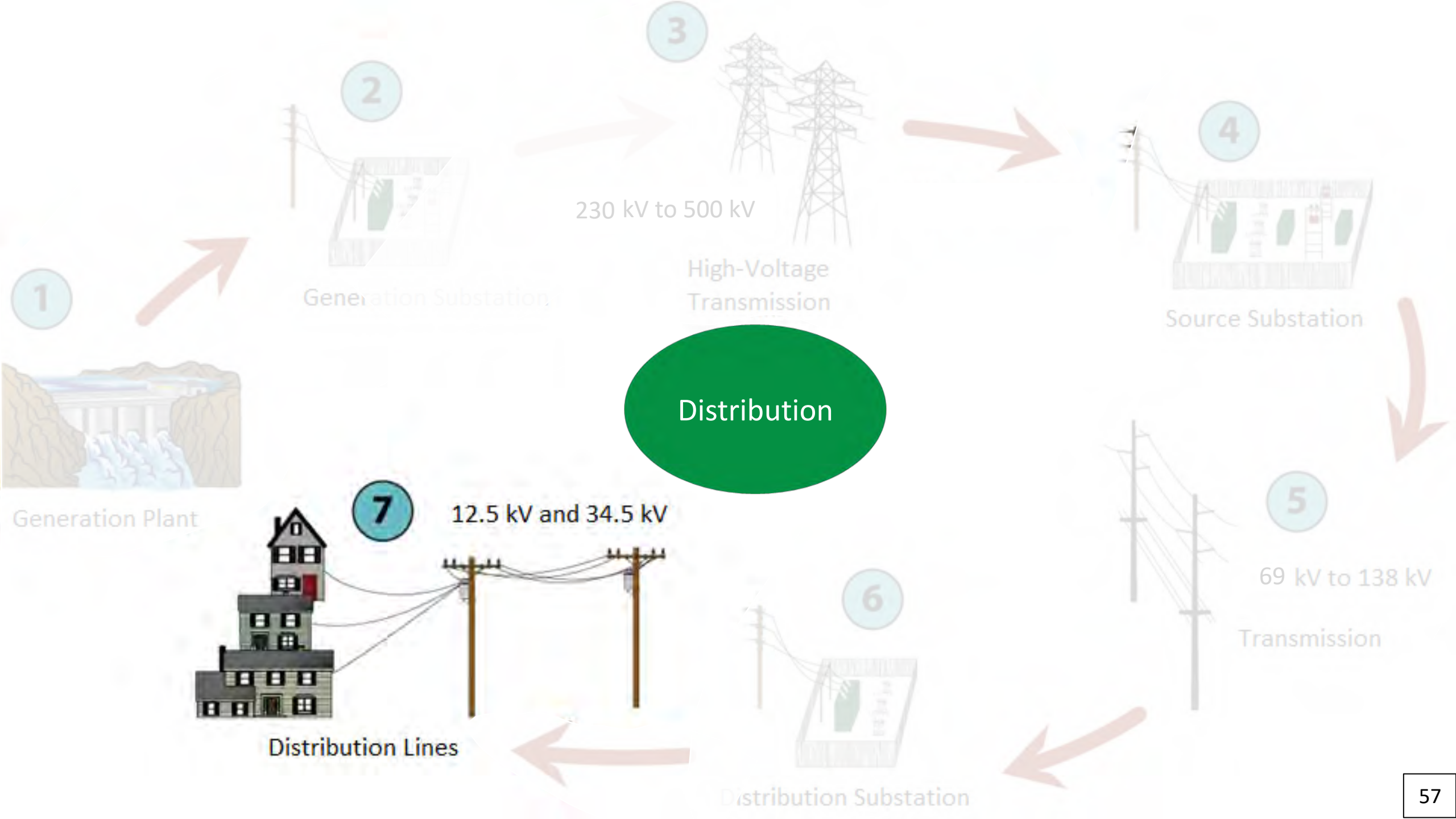
- These are the substations in your neighborhood

Distribution Substation

- Convert low voltage transmission to distribution
- Source power to homes and businesses
- 3-4 Acres

Substation Information

Substation Type	Capacity (MW)	Area (acres)	Cost
Source	200 - 600	5 - 10	$15M - $30M
Distribution	5 - 88	3 - 4	$11M - $13M


1
Generation Plant
2
Generation Substation
3
230 kV to 500 kV
High-Voltage Transmission
4
Source Substation
5
69 kV to 138 kV
Transmission
6
Distribution Substation
Distribution
7
12.5 kV and 34.5 kV
Distribution Lines

Distribution Lines

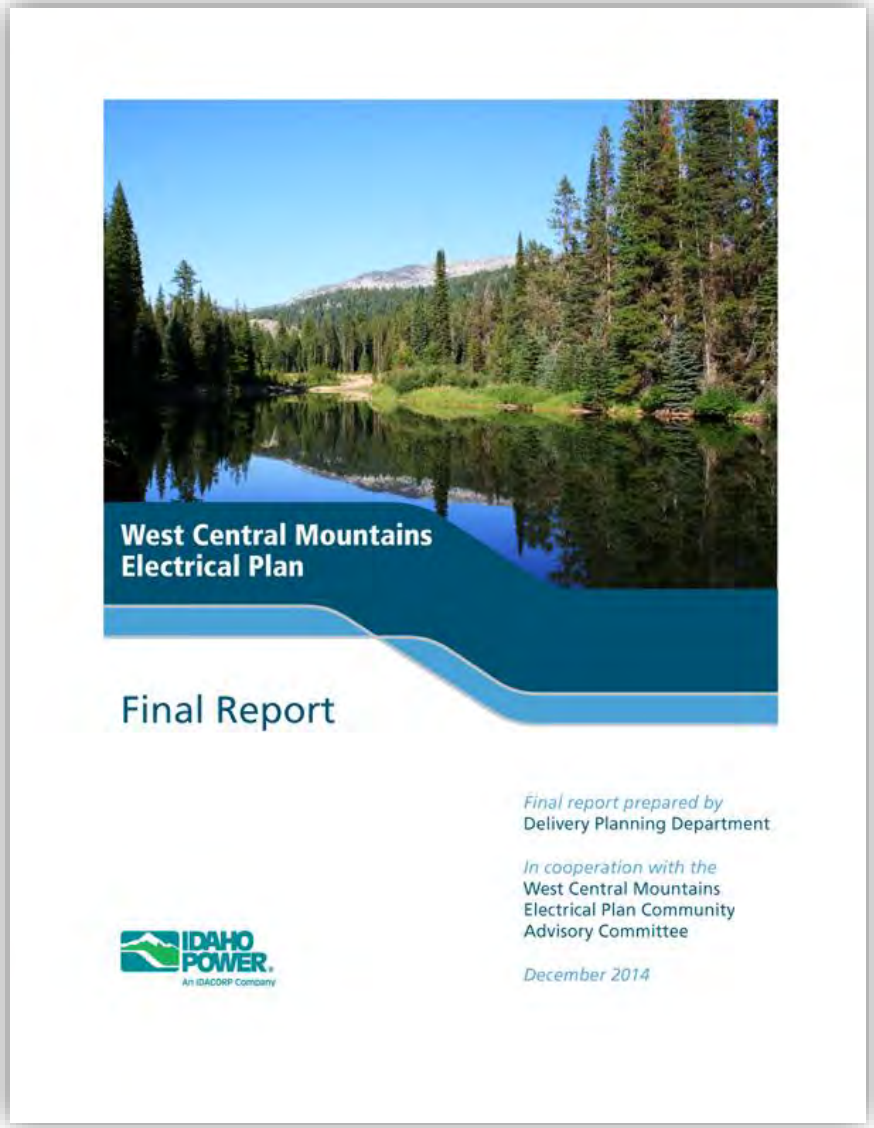
- 12.5 kV and 34.5 kV
- Overhead or Underground
- From Substation to Home
- Out of Scope

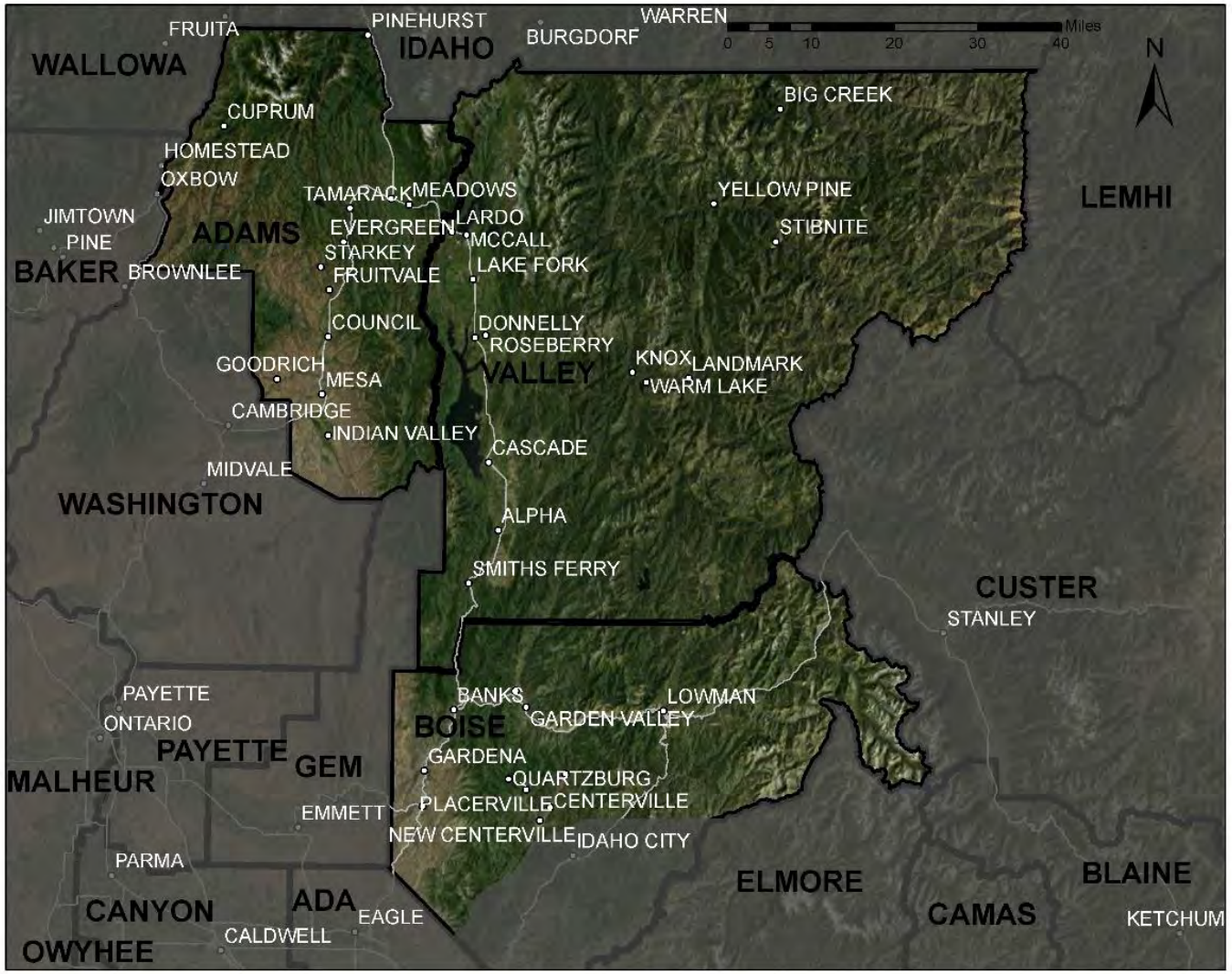
WESTERN CENTRAL MOUNTAINS
ELECTRICAL PLAN

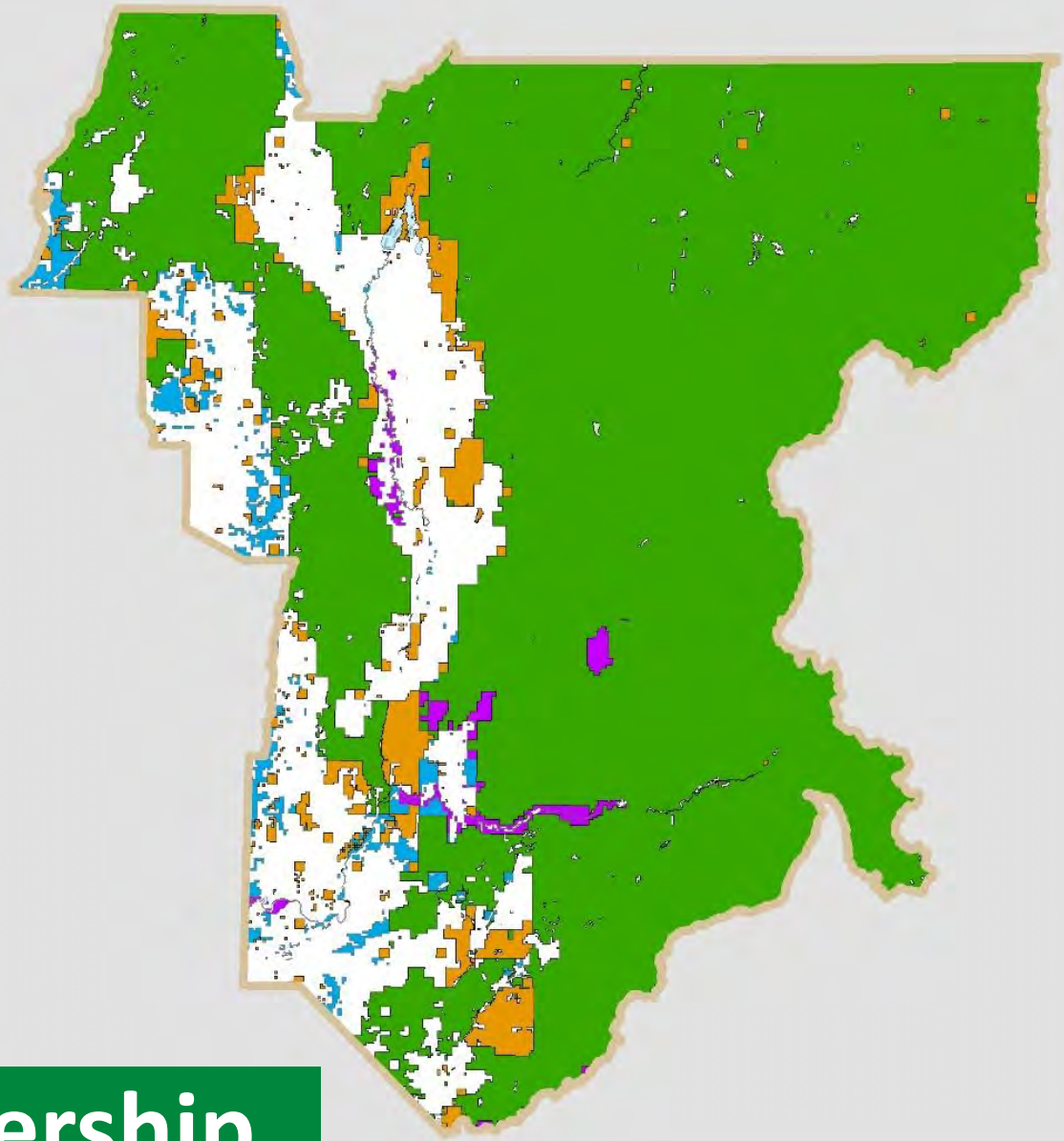
2014 WCMEP Review

Ted Solem
Senior Engineer
Idaho Power

West Central Mountains Electrical Plan (WCMEP)



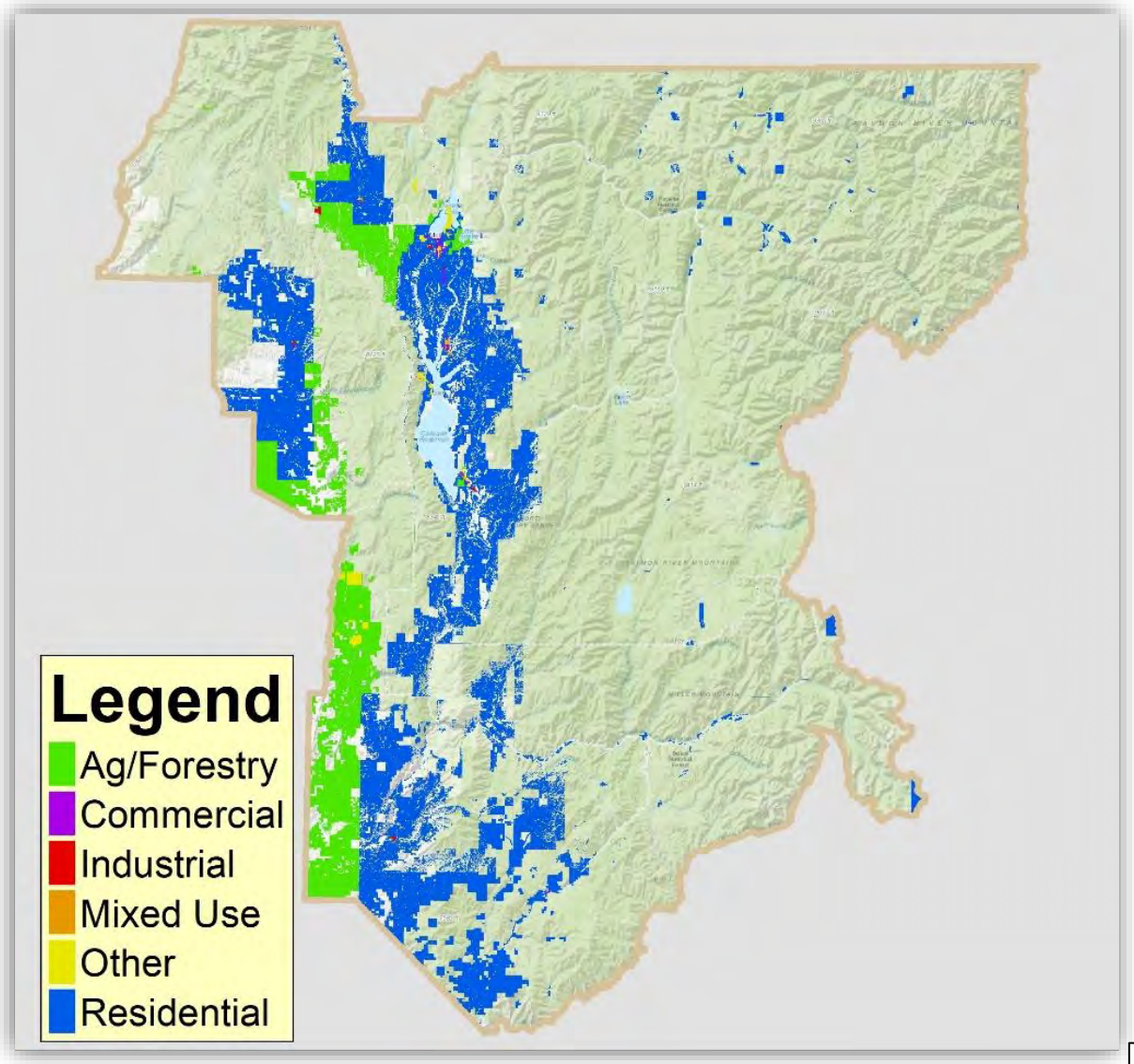




Land Ownership

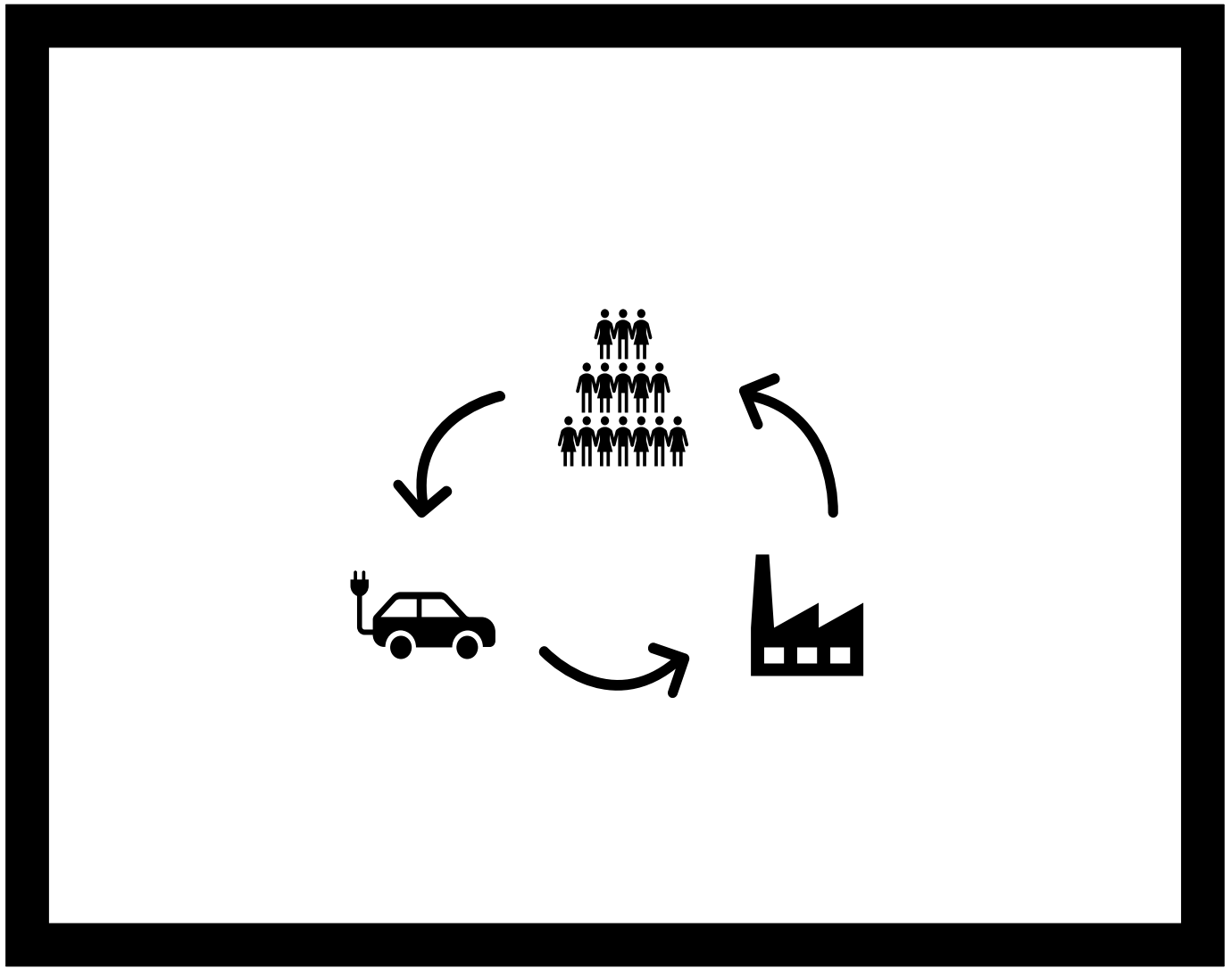
Land Use/Zoning

- Maps obtained from county and city jurisdictions
- Assigned zoning designations to all private land



Growth

Land



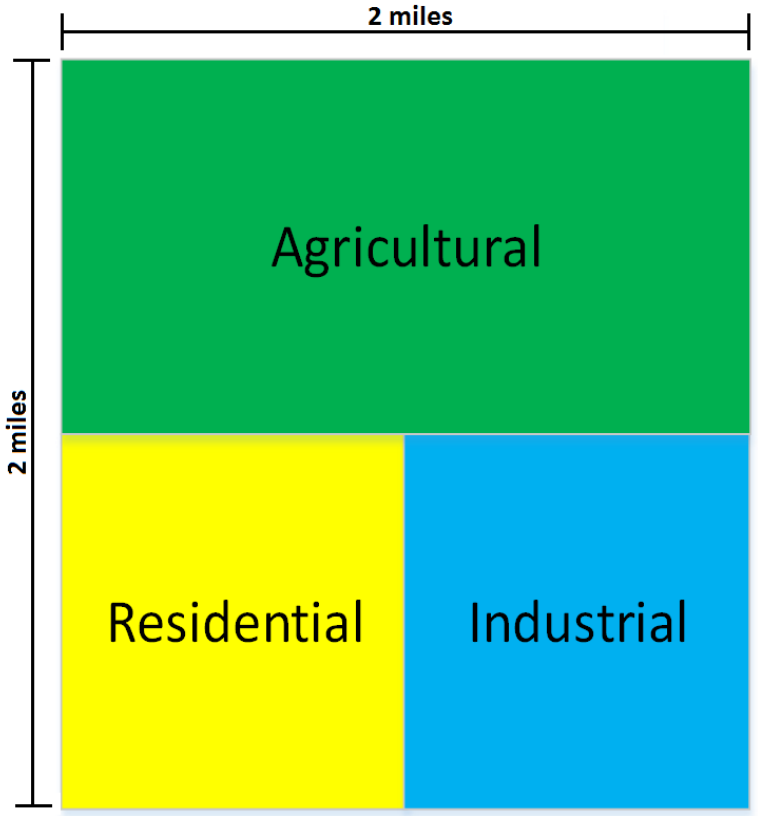
Water

Buildout

- The point in time when all available land is developed according to the land-use designations

Load Density

- Assigned a load density to land use/zoning designations for all private land
- = MW/mi^2

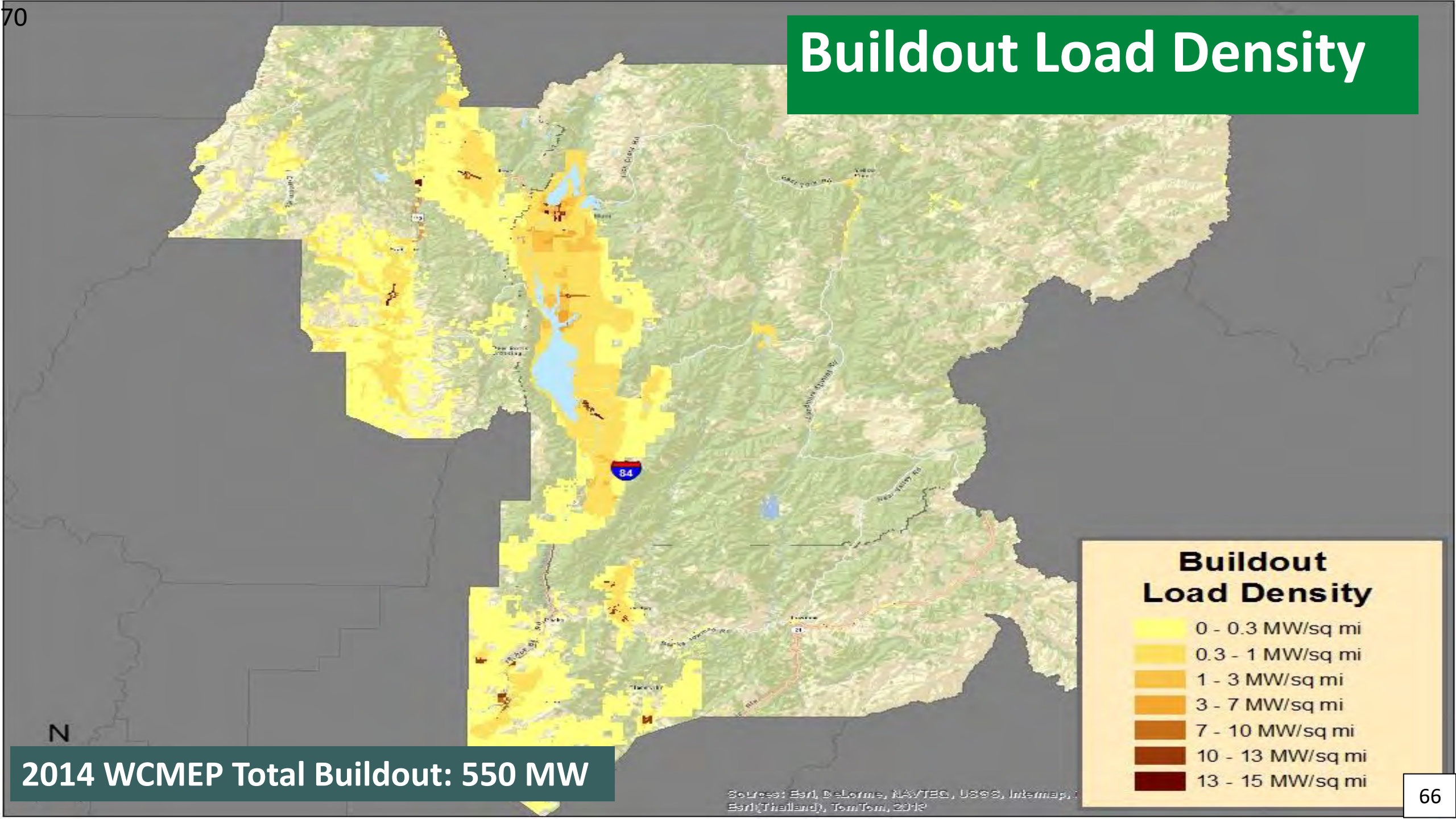


Zoning Description	Load Density (MW/mi^2)	Zone Area (mi^2)	Load (MW)
Agricultural	0.4	2	0.8
Residential	6	1	6
Industrial	40	1	40
Total		4	46.8

2014 West Central Mountains Loads by Jurisdiction

County	2014 Load (MW)	Buildout Load (MW)
Adams	25	141
Boise	20	109
Valley	60	300
Total	**105**	**550**

Buildout Load Density

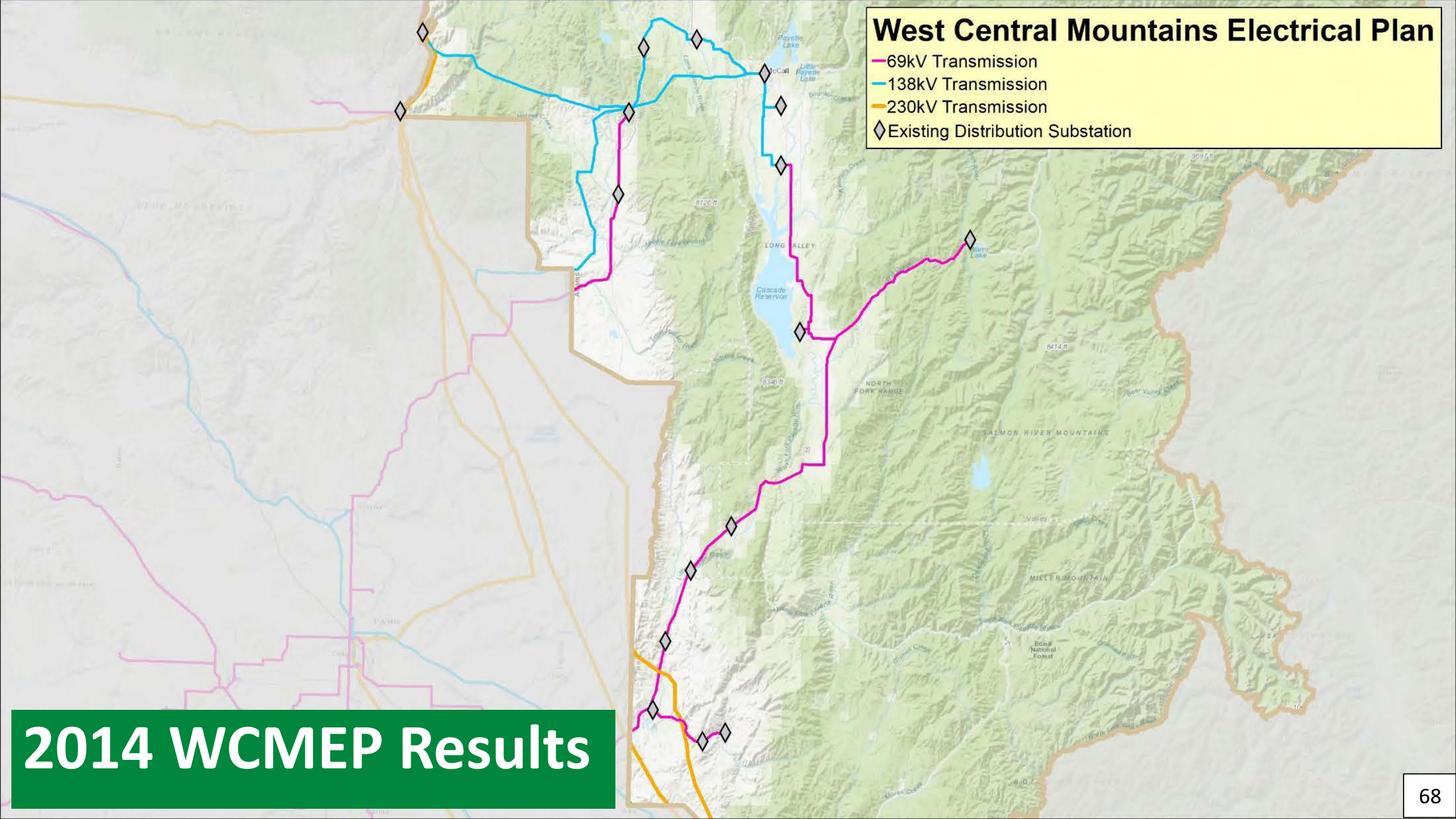


2014 WCMEP Total Buildout: 550 MW

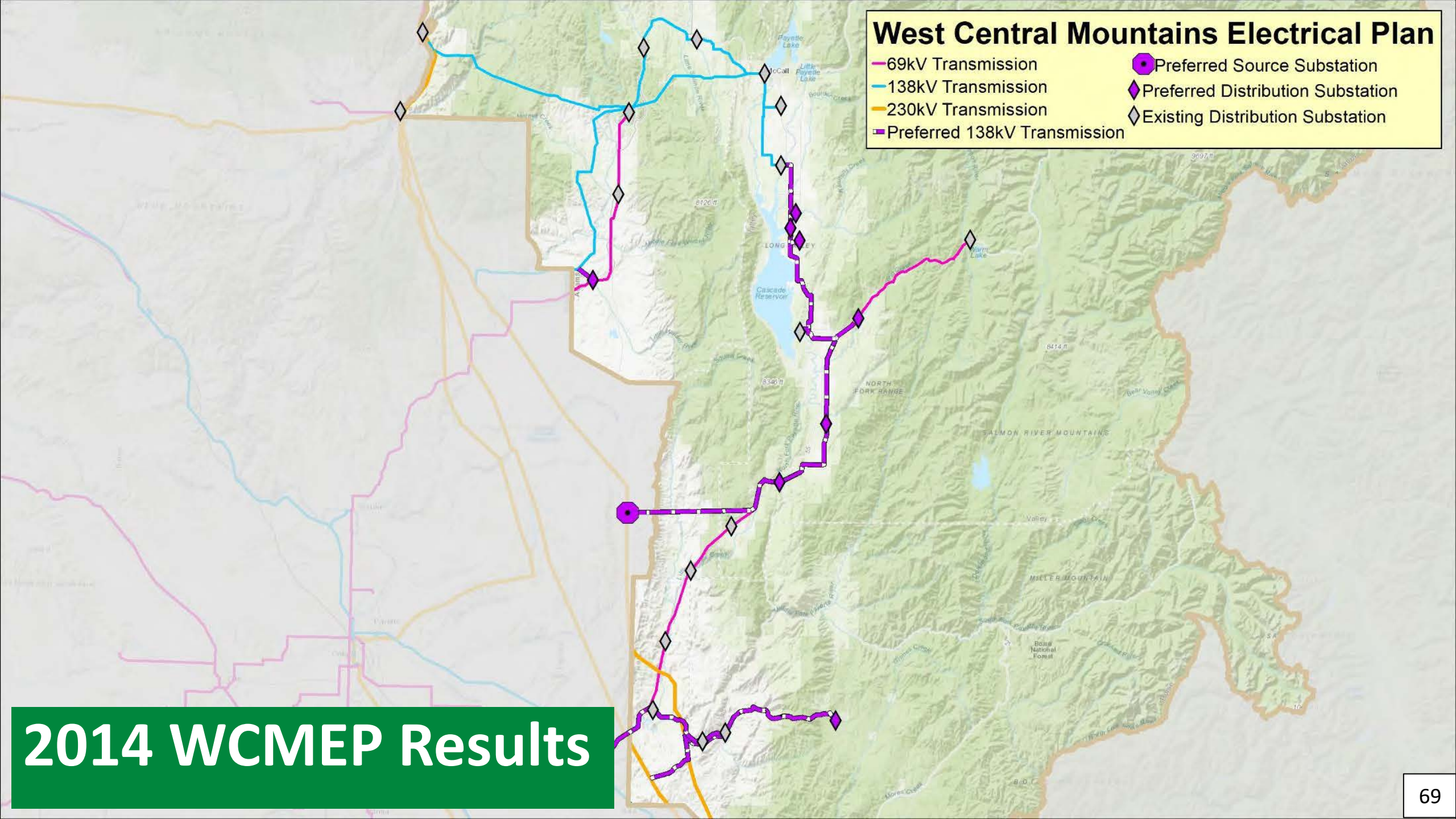
Community Goals & Siting Criteria

Site: Near industrial areas

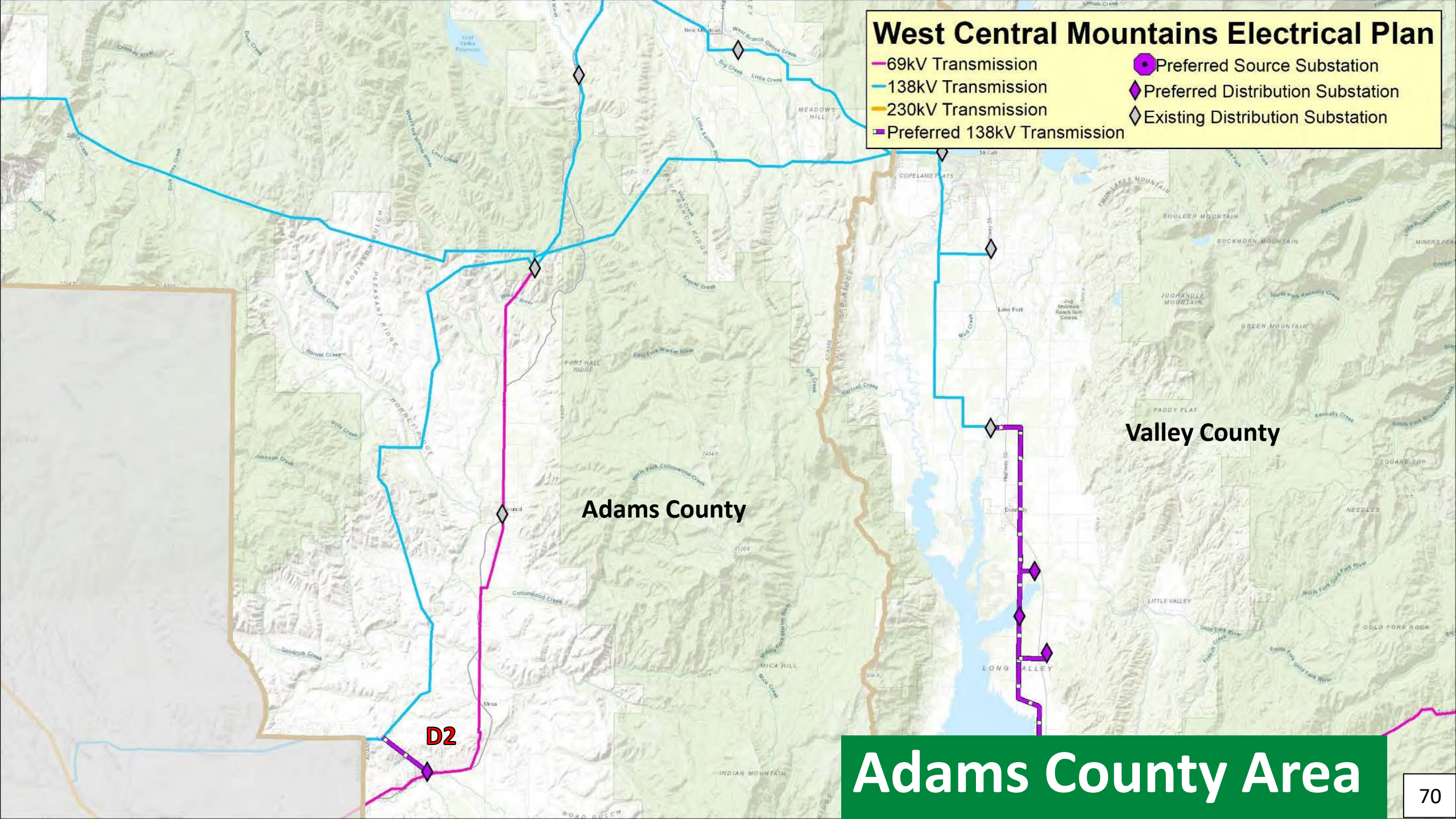
Avoid: Existing Waterways or Canals

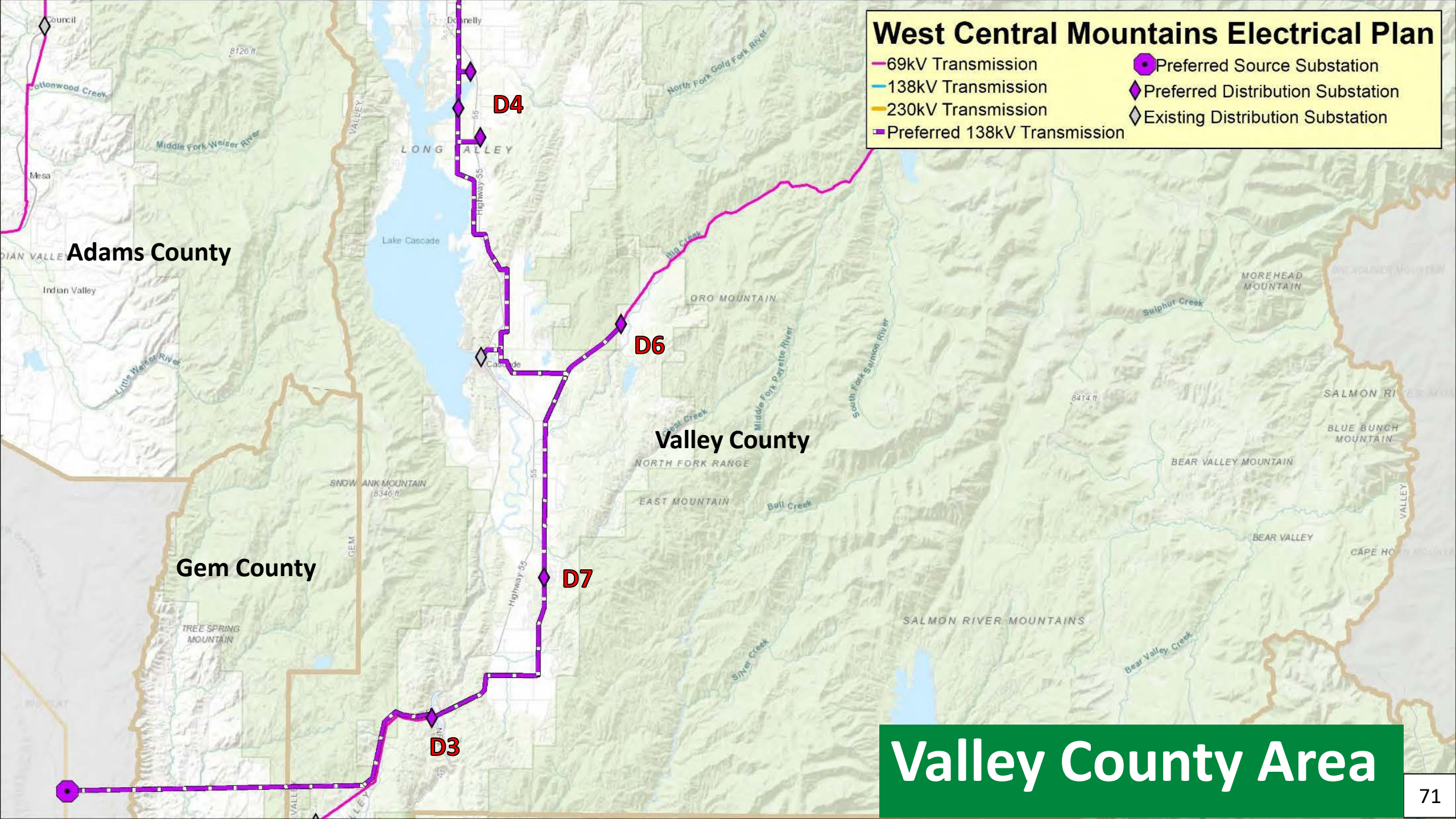


2014 WCMEP Results

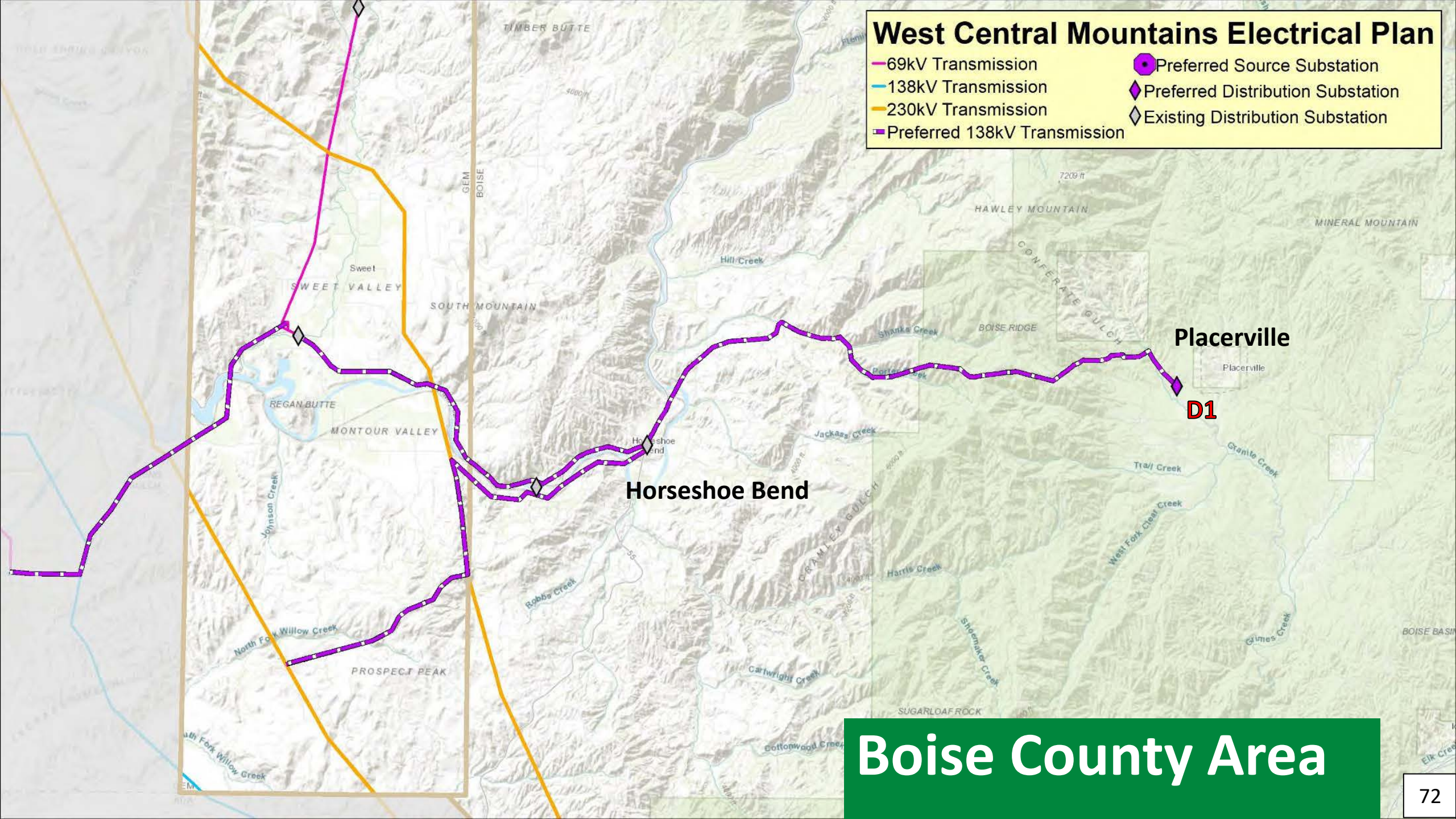


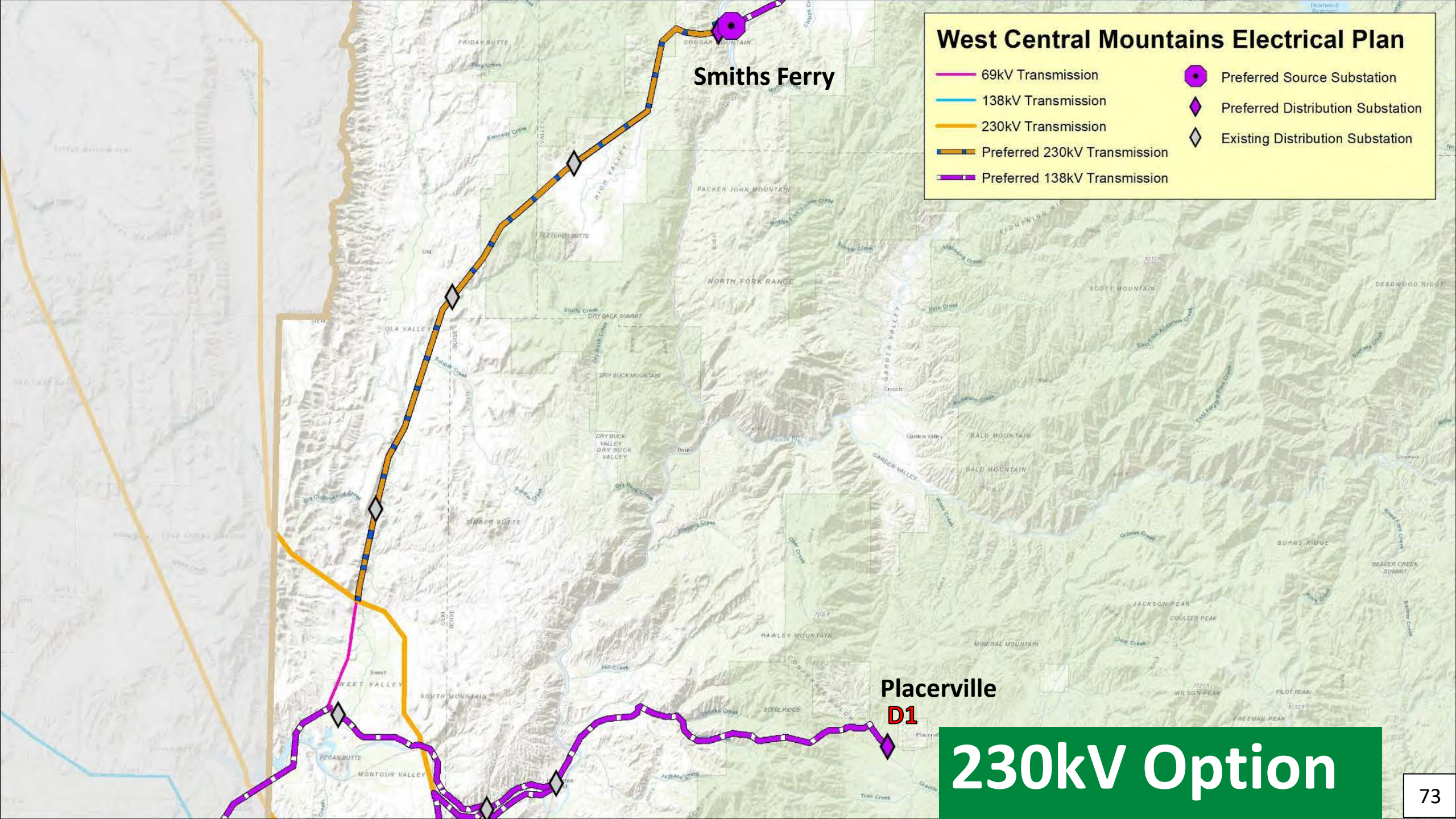
2014 WCMEP Results


West Central Mountains Electrical Plan
69kV Transmission
138kV Transmission
230kV Transmission
Preferred 138kV Transmission
Preferred Source Substation
Preferred Distribution Substation
Existing Distribution Substation
Adams County
Valley County
D2
Adams County Area



Valley County Area


West Central Mountains Electrical Plan
69kV Transmission
138kV Transmission
230kV Transmission
Preferred 138kV Transmission
Preferred Source Substation
Preferred Distribution Substation
Existing Distribution Substation
Placerville
D1
Horseshoe Bend
Boise County Area
TIMBER BUTTE
SWEET VALLEY
SOUTH MOUNTAIN
REGAN BUTTE
MONTOUR VALLEY
PROSPECT PEAK
HAWLEY MOUNTAIN
MINERAL MOUNTAIN
BOISE RIDGE
CONFEDERATE GULCH
DRAMLEY GULCH
SUGARLOAF ROCK
Hill Creek
Shanks Creek
Jackass Creek
Trail Creek
Granite Creek
West Fork Clear Creek
Harris Creek
Robbs Creek
Johnson Creek
North Fork Willow Creek
South Fork Willow Creek
Cartwright Creek
Shoemaker Creek
Grimes Creek
Cottonwood Creek
BOISE BASIN


West Central Mountains Electrical Plan
69kV Transmission
138kV Transmission
230kV Transmission
Preferred 230kV Transmission
Preferred 138kV Transmission
Preferred Source Substation
Preferred Distribution Substation
Existing Distribution Substation
Smiths Ferry
Placerville
D1
230kV Option

Why Update the WCMEP?

Changing Future Land Use

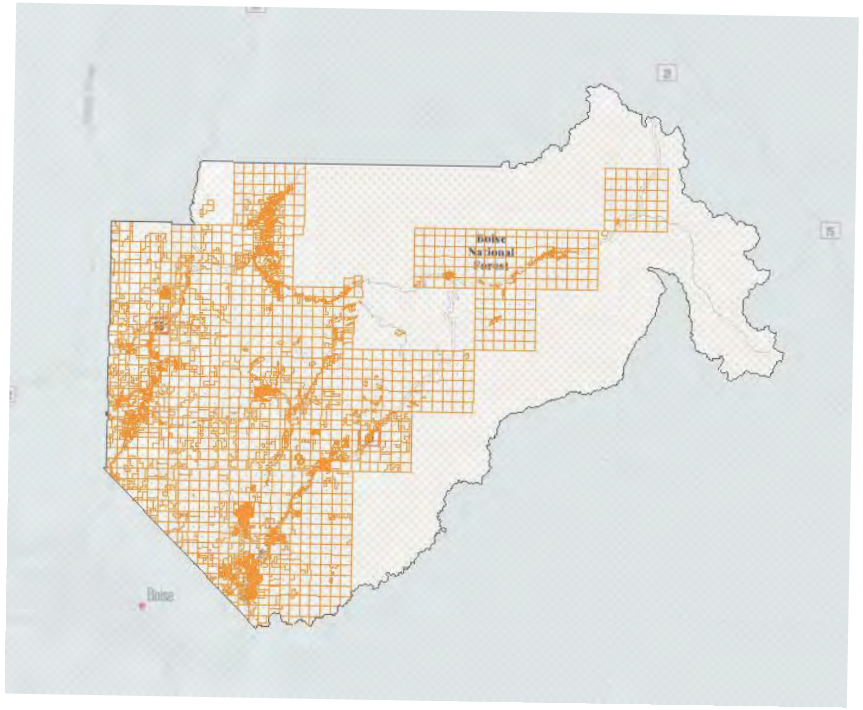
Evolving Community Goals

Load Growth

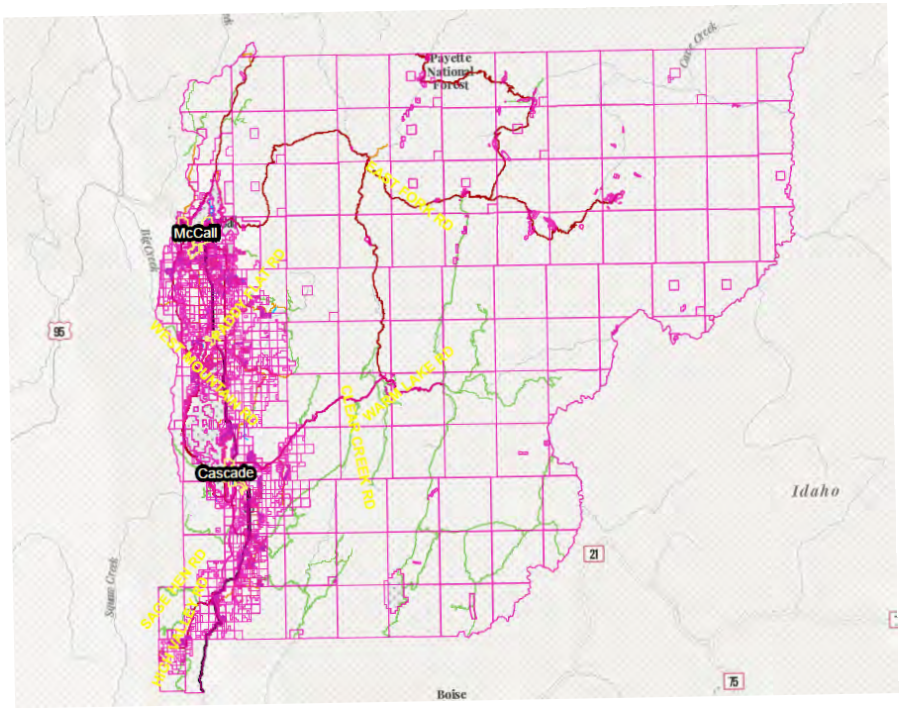
County	2014 Load (MW)	2024 Load (MW)
Adams	25	26
Boise	20	33
Valley	60	90
Total	**105**	**149**

Zoning Updates

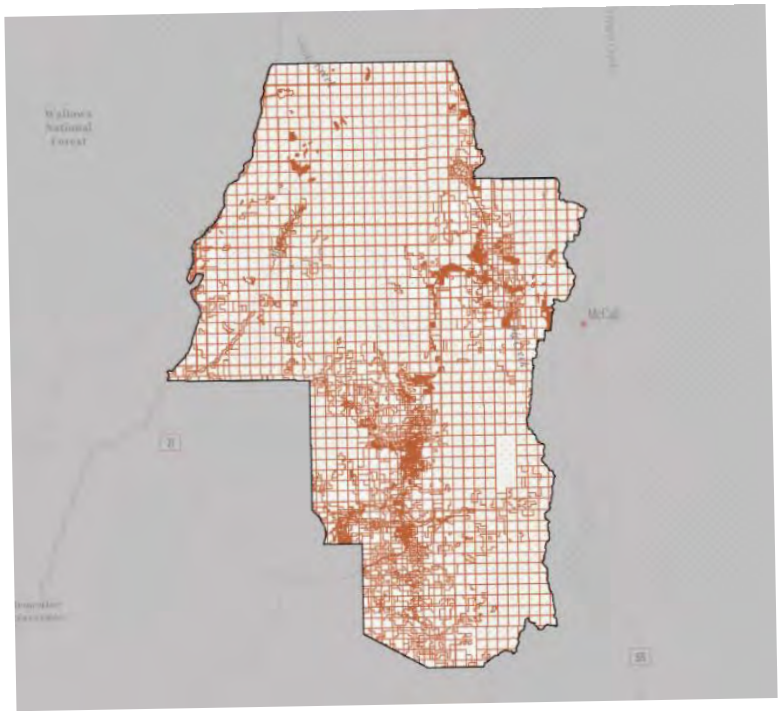
Boise County



Valley County



Adams County

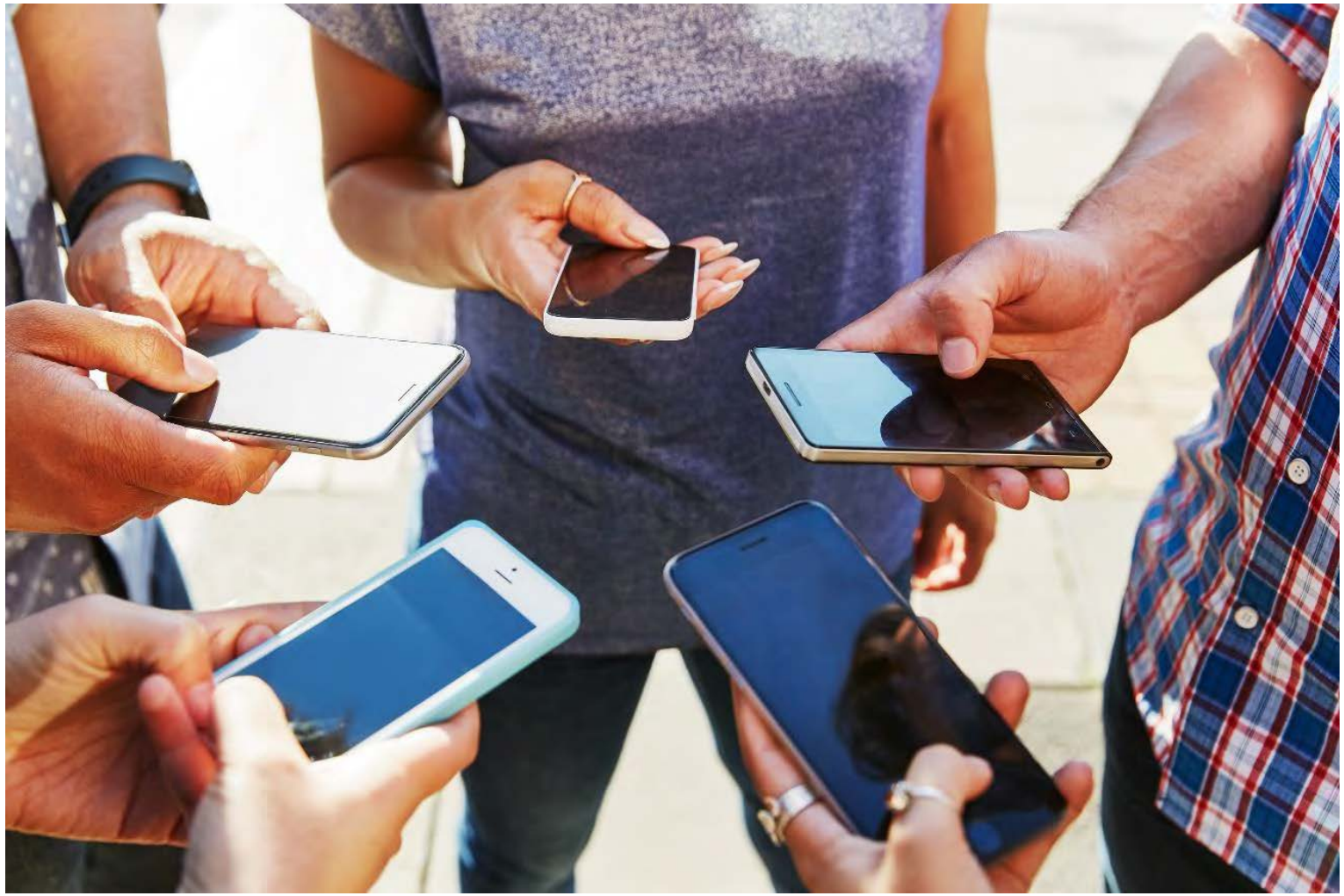


Customer Electrical Usage

Customer Electrical Usage

Customer Electrical Usage

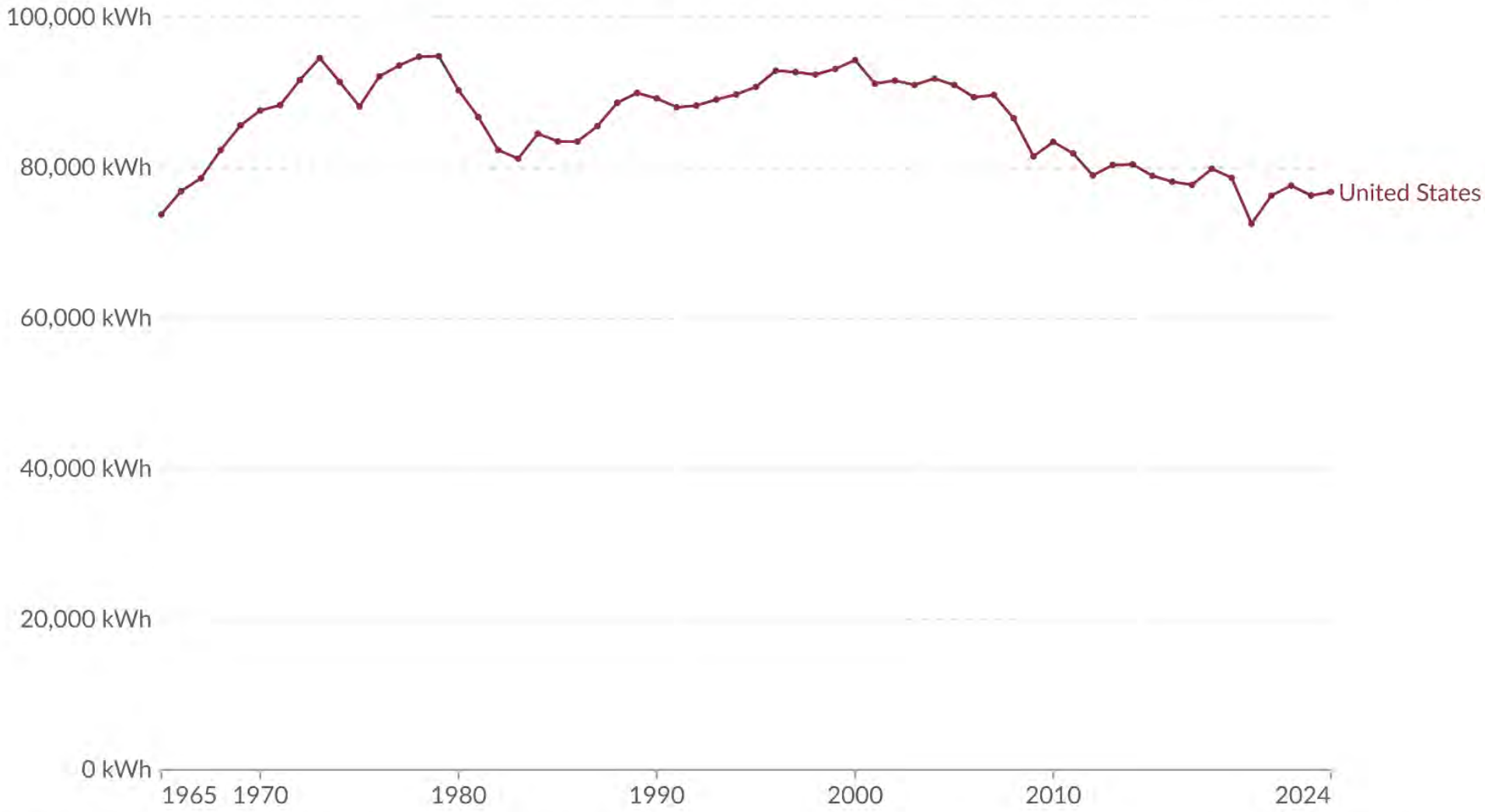
Customer Electrical Usage



Energy use per person

Our World in Data

Measured in kilowatt-hours[1] per person. Here, energy refers to primary energy[2] using the substitution method[3].



Data source: U.S. Energy Information Administration (2025); Energy Institute - Statistical Review of World Energy (2025); Population based on various sources (2024)

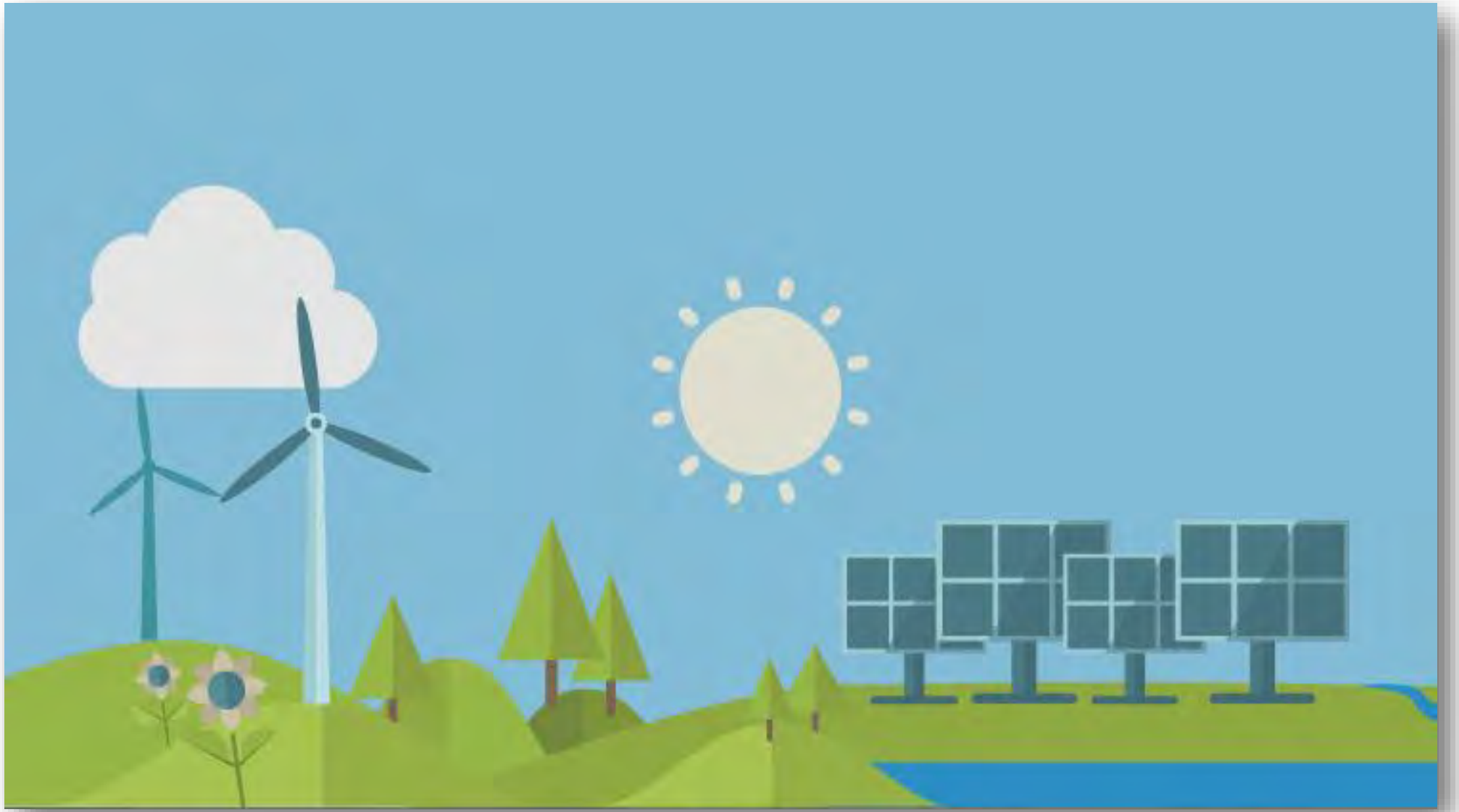
OurWorldinData.org/energy | CC BY

Electrification

Electrification

Electrification

Electrification



Electrification

WCMEP Update

County	2014 WCMEP Buildout Load (MW)	2025 WCMEP Update Buildout Load (MW)
Adams	141	152
Boise	109	122
Gem	N/A	27
Valley	300	512
Total	**550**	**813**

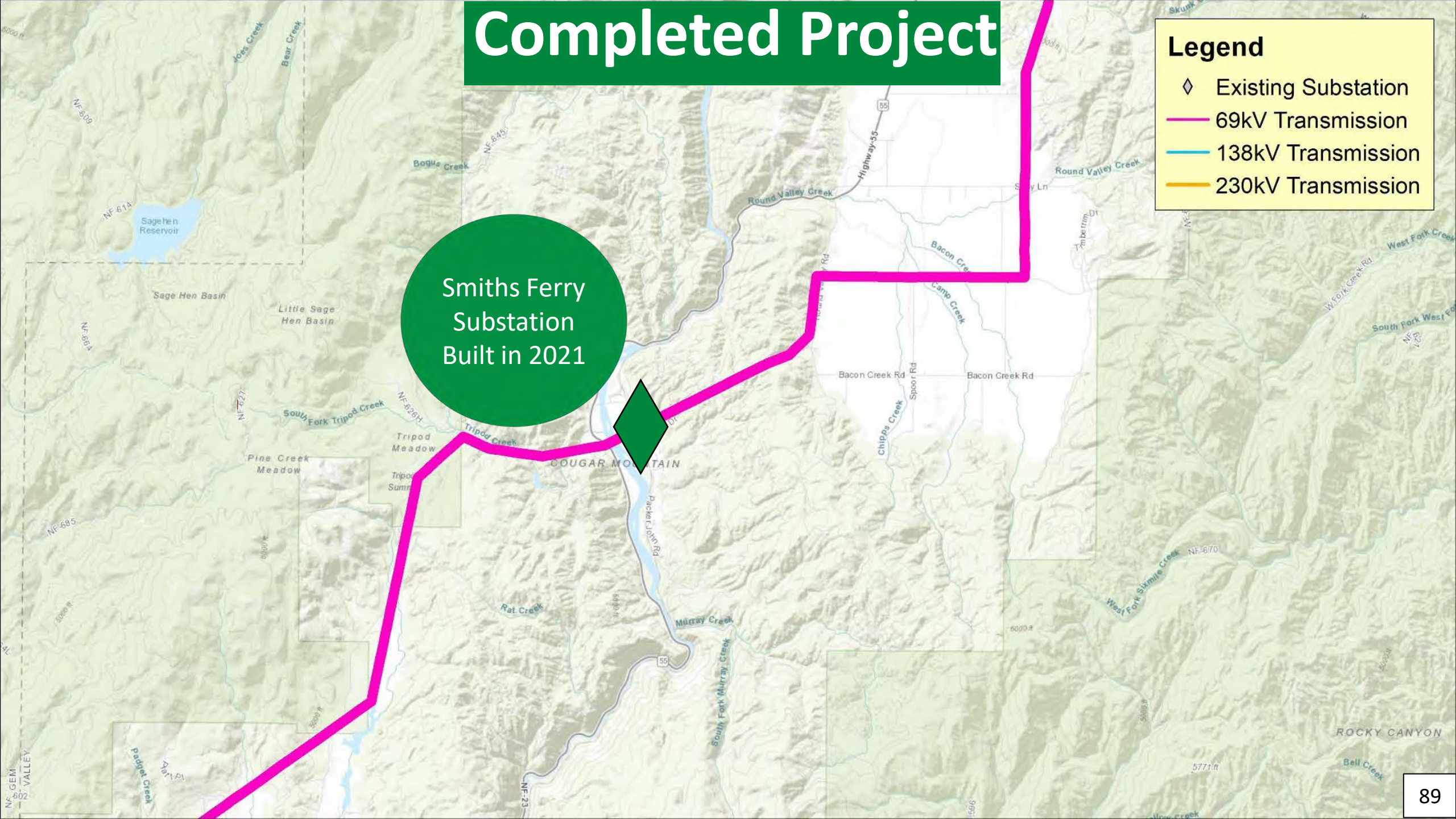
Questions?

WESTERN CENTRAL MOUNTAINS
ELECTRICAL PLAN

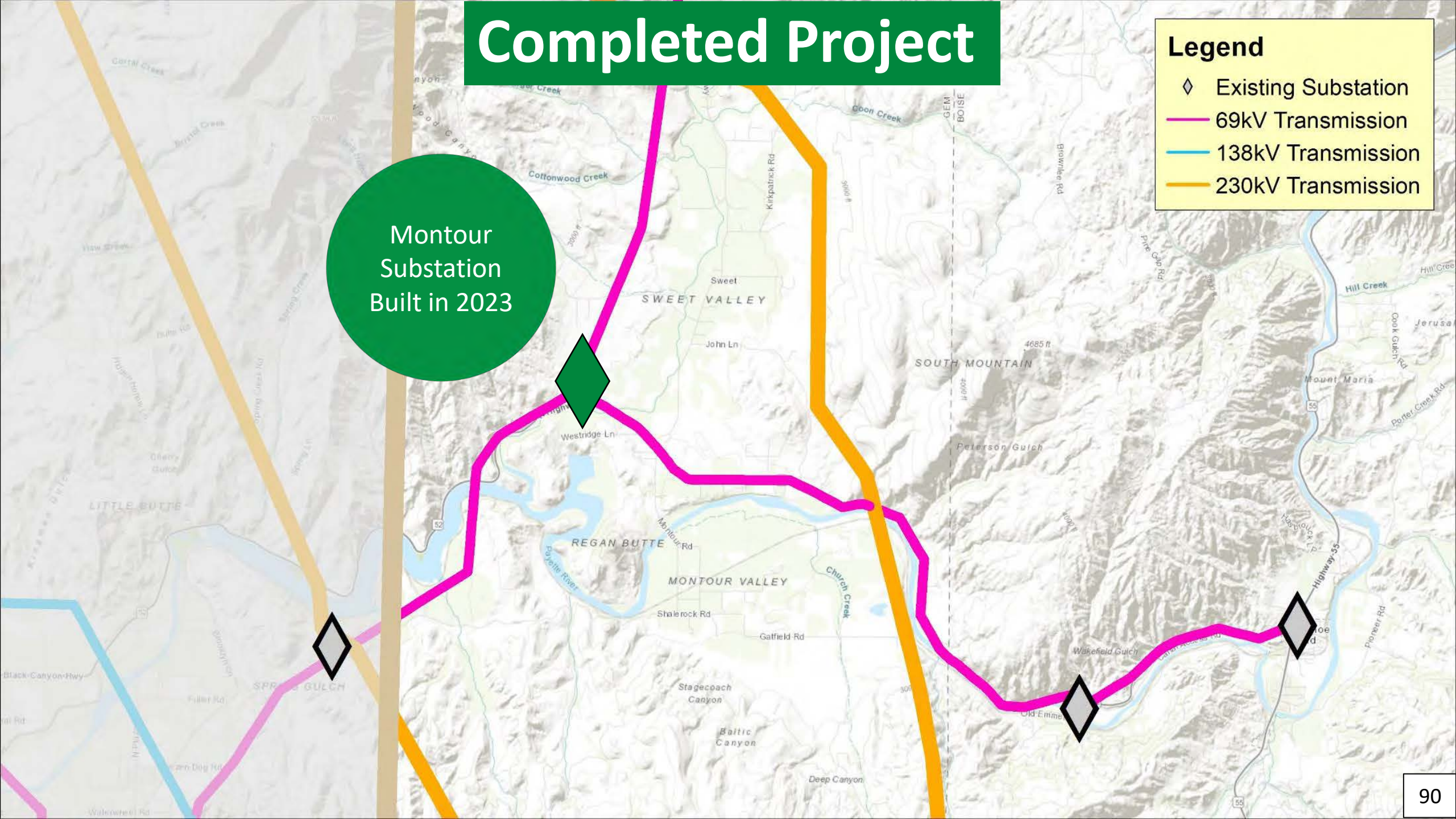
Current Conditions

Ted Solem
Senior Engineer
Idaho Power

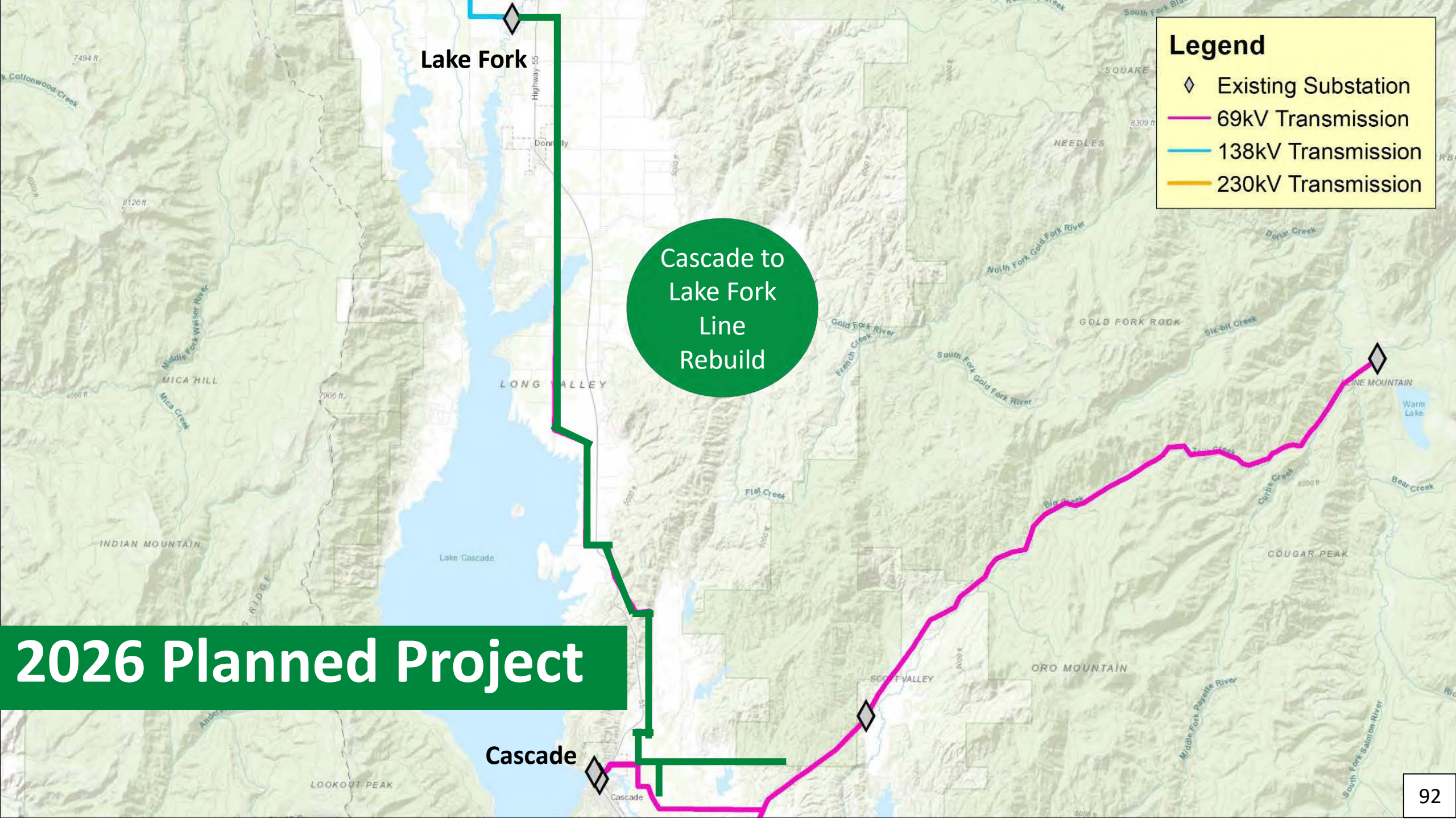
Completed Project



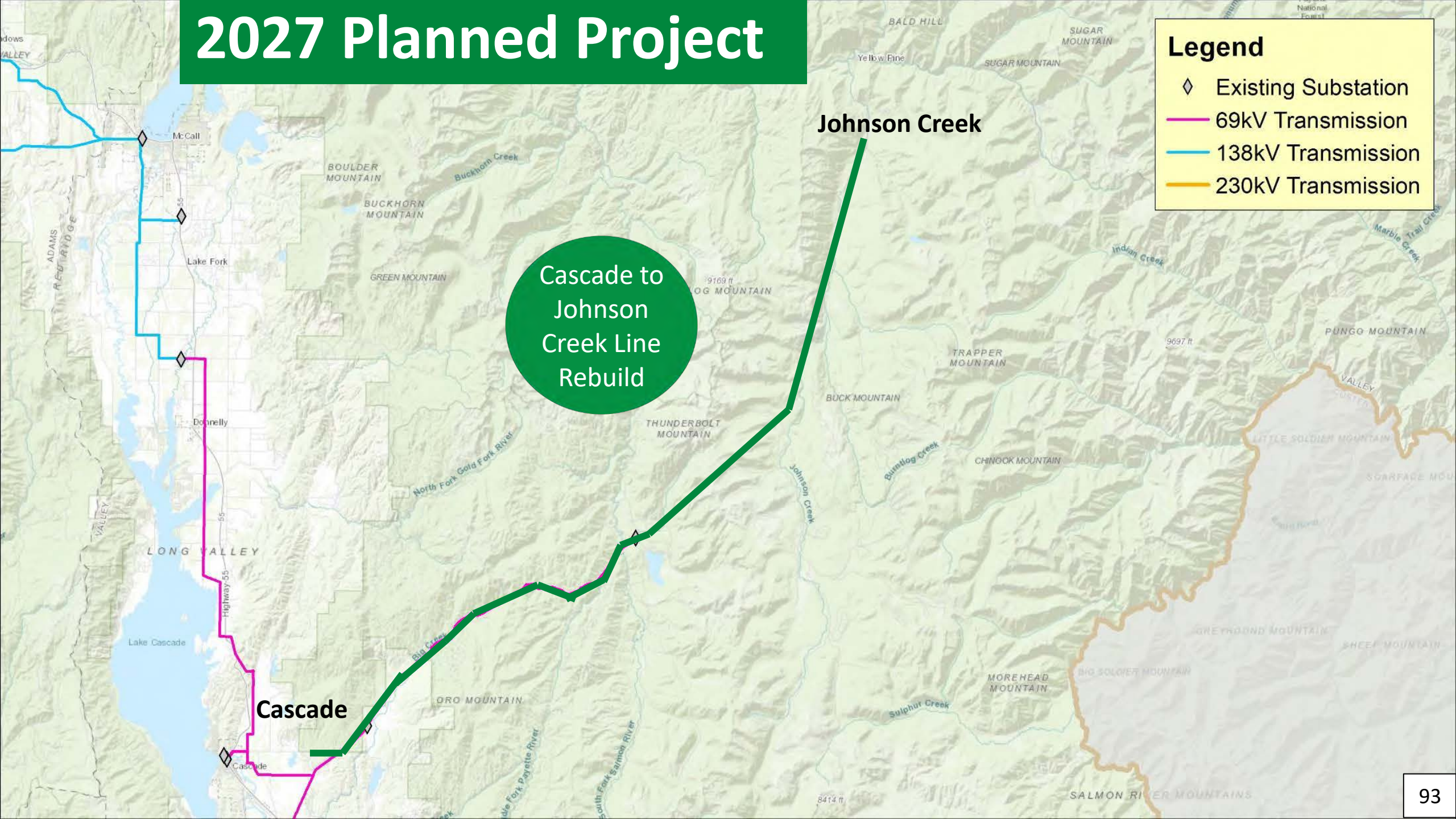
Completed Project



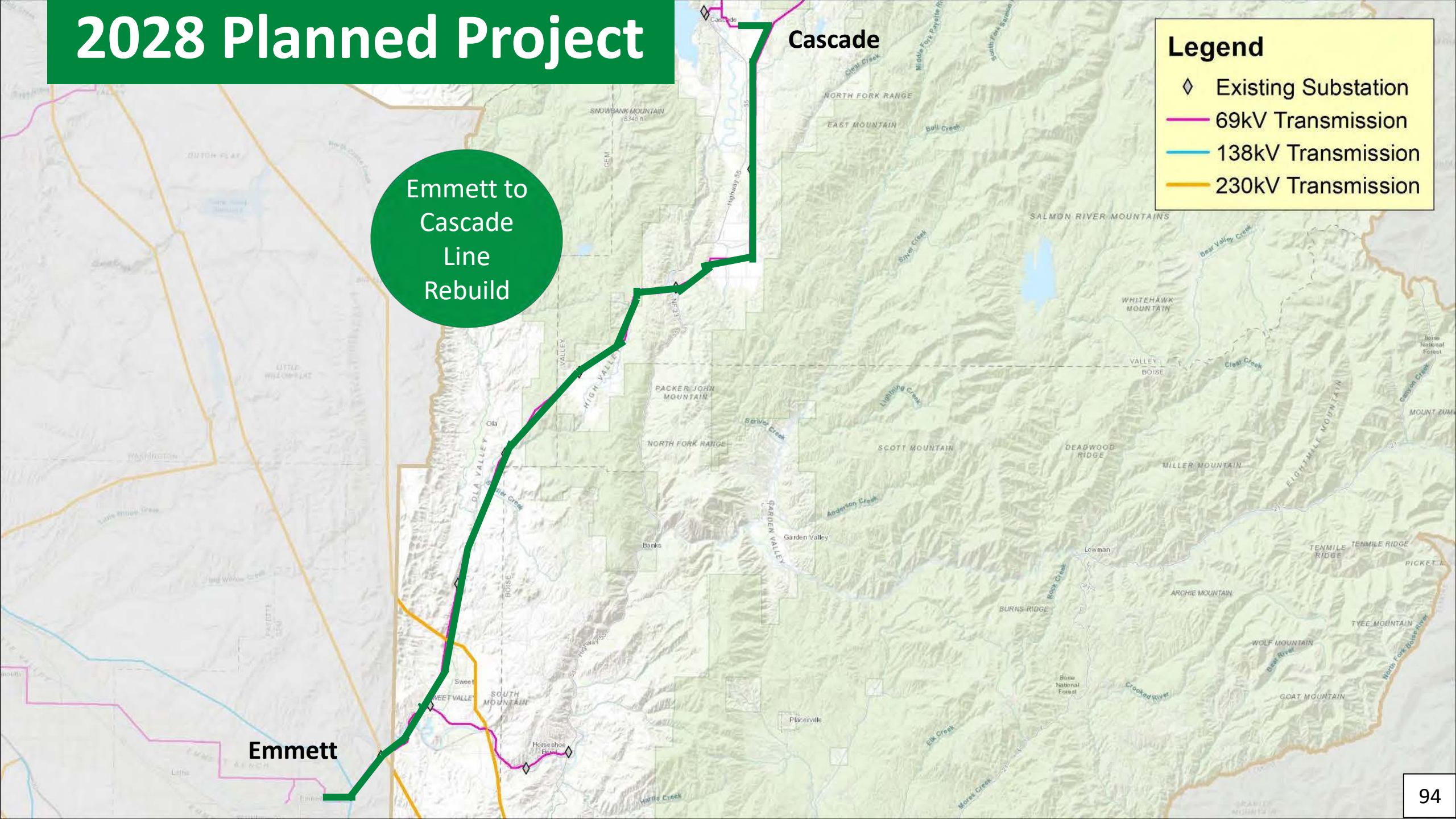
2026 Planned Project


Legend
Existing Substation
69kV Transmission
138kV Transmission
230kV Transmission
Lake Fork
Cascade to Lake Fork Line Rebuild
Cascade
2026 Planned Project
Lake Cascade
LONG VALLEY
MICA HILL
INDIAN MOUNTAIN
NEEDLES
GOLD FORK ROCK
COUGAR PEAK
ORO MOUNTAIN
LOOKOUT PEAK
Highway 55
Donnelly
Gold Fork River
South Fork Gold Fork River
North Fork Gold Fork River
Flat Creek
Bear Creek
Warm Lake
Middle Fork Payette River
South Fork Salmon River

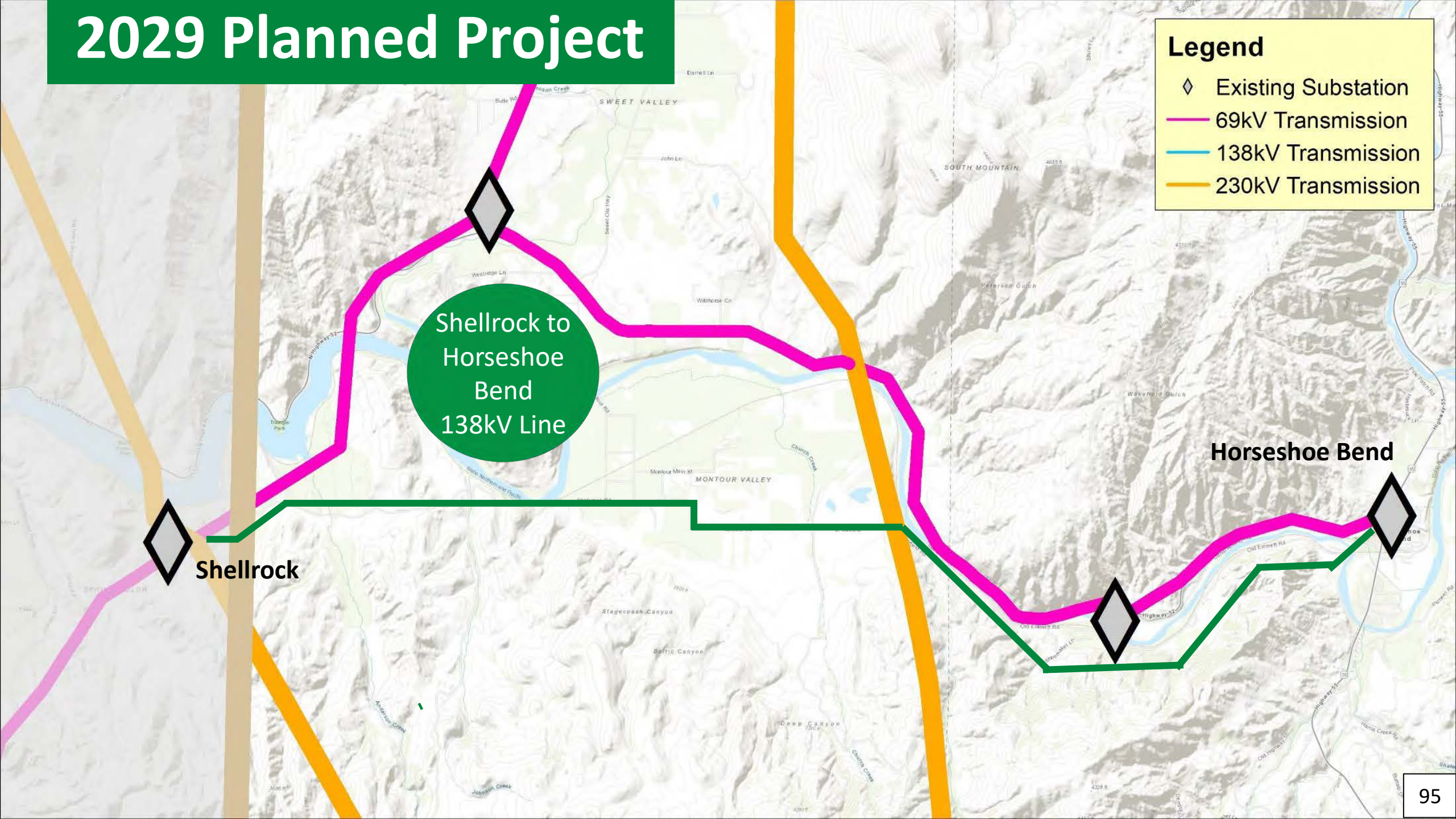
2027 Planned Project



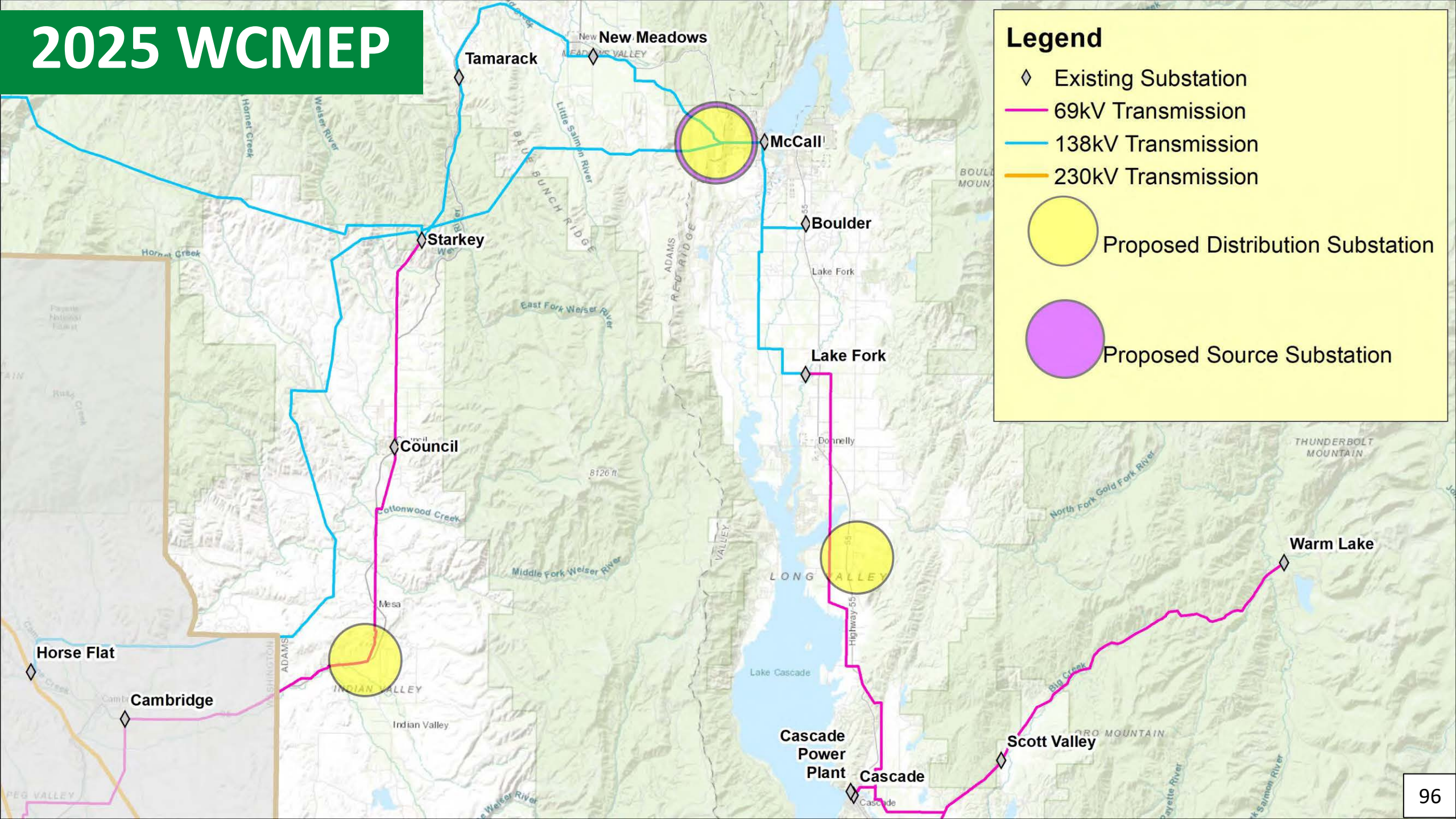
2028 Planned Project



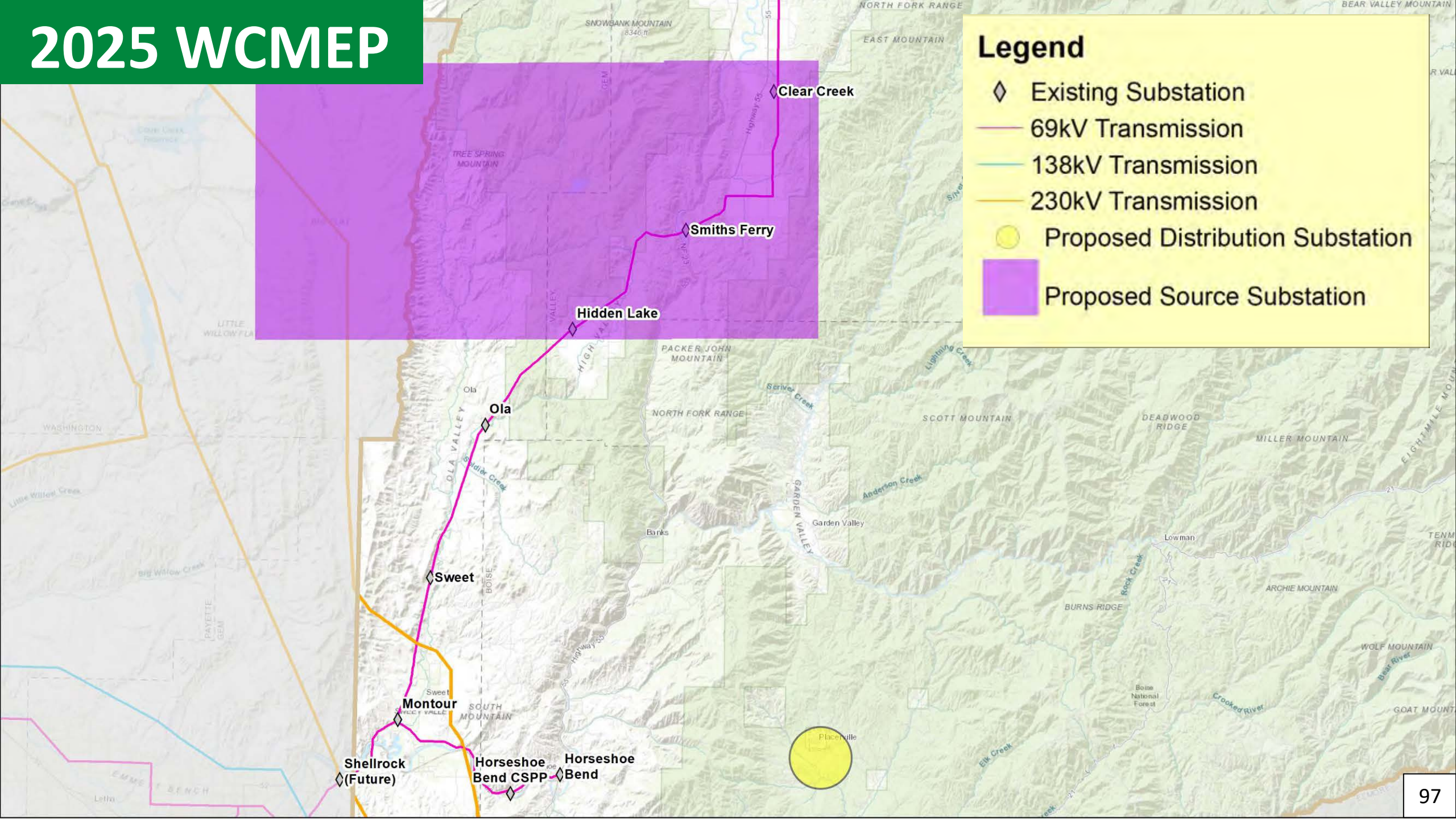
2029 Planned Project



2025 WCMEP


Legend
Existing Substation
69kV Transmission
138kV Transmission
230kV Transmission
Proposed Distribution Substation
Proposed Source Substation
New Meadows
Tamarack
McCall
Boulder
Starkey
Lake Fork
Council
Horse Flat
Cambridge
Indian Valley
Mesa
Cascade Power Plant
Cascade
Scott Valley
Warm Lake
Lake Cascade
Donnelly
Hornet Creek
Weiser River
Little Salmon River
East Fork Weiser River
Middle Fork Weiser River
Cottonwood Creek
North Fork Gold Fork River
Big Creek
Highway 55
LONG VALLEY
BLUE BUNCH RIDGE
ADAMS RED RIDGE
THUNDERBOLT MOUNTAIN
ORO MOUNTAIN
8126 ft

2025 WCMEP


Legend
Existing Substation
69kV Transmission
138kV Transmission
230kV Transmission
Proposed Distribution Substation
Proposed Source Substation
Clear Creek
Smiths Ferry
Hidden Lake
Ola
Sweet
Montour
Shellrock (Future)
Horseshoe Bend CSPP
Horseshoe Bend
Placerville
SNOWBANK MOUNTAIN
8346 ft
NORTH FORK RANGE
EAST MOUNTAIN
TREE SPRING MOUNTAIN
PACKER JOHN MOUNTAIN
SCOTT MOUNTAIN
DEADWOOD RIDGE
MILLER MOUNTAIN
ARCHIE MOUNTAIN
BURNS RIDGE
WOLF MOUNTAIN
SOUTH MOUNTAIN
Banks
Garden Valley
Lowman
Boise National Forest
Crooked River
Elk Creek
Rock Creek
Anderson Creek
Scriver Creek
Lightning Creek
Soldier Creek
Big Willow Creek
Little Willow Creek
Highway 55
OLA VALLEY
GARDEN VALLEY
BOISE
PAYETTE
WASHINGTON
EMMETT BENCH
Letha

WESTERN CENTRAL MOUNTAINS
ELECTRICAL PLAN

Community Goals And Siting Criteria

Jim Burdick
Engineering Leader
Idaho Power

WESTERN CENTRAL MOUNTAINS
ELECTRICAL PLAN

Next Steps

Jim Burdick
Engineering Leader
Idaho Power