

Helpful Facts – Eastern Idaho Electrical System

- Existing electrical load is about 500 MW.
- Buildout electrical load estimated to be 2000 MW.
 - See area drawings for detailed buildout requirements
- 3 additional *source* substations will be needed at buildout
- 7 new *distribution* substations will be needed at buildout
- A Source substation must have at least two high voltage lines (230kV or 345kV) to it.
- More than one transmission line can be placed in the same corridor
 - Multiple transmission lines alongside each other = wider corridor (see transmission line information for Right of Way information)
 - Multiple lines on the same pole = Taller and/or larger poles
- Transmission Line Capacity Summary for New Transmission Lines
 - 345 kV – 1000 MW
 - 230 kV – 500 MW
 - 138 kV – 200 MW
 - 46 kV – 40 MW
- Transmission line capacities can vary depending on wire size, circuit length and tower construction

System Funding

- Typically Idaho Power funding, which is included in the ratepayer base, includes costs for overhead transmission systems and facilities
- Underground transmission facilities are typically paid for by third party: Cities, counties, private developments, etc.
- Third part pays difference between overhead and underground for new transmission.
- Routes and designs for transmission systems that vary substantially from the most straightforward routes and designs, may require all or partial funding from sources other than Idaho Power

4 Step Committee Mapping Process

1. Site source stations (additional capacity required in each area)
2. Determine routes for high voltage transmission
 - Minimum two HV transmission lines to each source station
3. Site seven new distribution stations (light yellow circles on map)
 - Three in Pocatello area
 - Two in American Falls area
 - Two in Blackfoot area
4. Determine routes for sub-transmission lines
 - Connect all new distribution substations
 - Upgrade existing lines or include new lines as necessary per buildout MW projections to existing distribution substations.

Community Advisory Committee Siting Criteria

Reliability: Provide reliable electric service to all Idaho Power customers in the Eastern Idaho service area

- Provide adequate system capacity (including upgrades) to satisfy N-1 conditions for main grid transmission throughout the eastern Idaho service area
- Provide redundant and reliable systems (including upgrades) that provide a minimum of N-1 capability for main grid transmission throughout the eastern Idaho service area
- Continue maintenance and operation programs that improve and ensure optimum reliability and dependability for existing and new commercial, industrial, agricultural and residential customers; especially in systems that are not N-1
- Provide redundancy for industrial clusters
- Improve N-1 capability for 46kv systems (sub-transmission and distribution) where feasible; including systems to support industry in rural locations such as Rockland and Blackfoot

Design and Sustainability: Design electrical infrastructure and programs based on the most appropriate technology and to achieve optimum sustainability of the system

- Use the newest, best and most efficient applicable technology; adjust designs as needed
- Design infrastructure to be long-lasting and aesthetically pleasing as much as feasible; temper with realistic costs
- Use more sustainable and renewable materials and resources where feasible; emphasize local sources
- Pursue the goal of Net Zero distribution for residential service
- Provide /utilize power closer to home – consider source generation opportunities when designing infrastructure
- Design facilities with optimum reliability, i.e. survive car-pole crashes, etc.
- Design and provide service coverage that is flexible to meet changing needs and conditions
- Design and develop facilities that support the sustainability and economic viability of communities, especially targeting growth and improvement areas
- Plan, design, site and develop facilities with consideration for potential impacts to all aspects of the environment; physical, social, cultural, economic, historic, etc.

Siting: Site all new facilities to achieve optimal function and acceptable impact

- Avoid residential areas where feasible; be flexible and consider potential impacts
- Preserve agricultural land operations
- Be responsive to jurisdictional issues
- Be responsive to physical and social environmental issues; i.e. avoid compromising view sheds such as West Bench
- Site new facilities where aesthetically-pleasing structures can be used
- Site new facilities that result in decreased environmental issues and costs
- Use major/existing corridors and identified right of ways (i.e. transportation, BLM, USFS) where feasible; be flexible and consider potential impacts
- Focus on siting infrastructure that will efficiently serve large industrial loads
- Site new facilities to take advantage of potential future generation especially nuclear, manure, and renewable such as solar, wind, etc.
- Incorporate the use of acceptable mitigation where appropriate and feasible

Cost Effectiveness: Consider costs in all aspects of service, programs and new facilities development

- Maintain low costs and energy prices; maintain status as a low cost leader
 - Be cost effective in design and siting of new infrastructure facilities
 - Consider future impacts to property owners for infrastructure right of way; balance cost with acceptability
 - Utilize existing infrastructure (where applicable) to reduce new costs
 - Utilize existing right of way (where applicable) to reduce new costs
 - Consider impacts to costs due to siting on public vs. private vs. tribal lands
 - Support local low-cost generation options
 - Conduct a cost-benefit analysis as part of determining the best and balanced solution
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Transmission Line Mapping Information

345 kV Transmission

tape color = green

Capacity = 1000 MW

Cost ~ \$750k - \$1000k per mile OH
(plus ROW and permitting)

H-Frame ROW ~ 150 ft.

Single pole ROW ~ 100 ft.



230 kV Transmission

tape color = orange

Capacity = 500 MW

Cost ~ \$400k - \$500k per mile OH
(plus ROW and permitting)

H-Frame ROW ~ 120 ft.

Single pole ROW ~ 70 ft.



138 kV Transmission

tape color = blue

Capacity = 200 MW

Cost ~ \$200k - \$300k per mile OH
(plus ROW and permitting)

H-Frame ROW ~ 100 ft.

Single pole ROW ~ 50 ft.



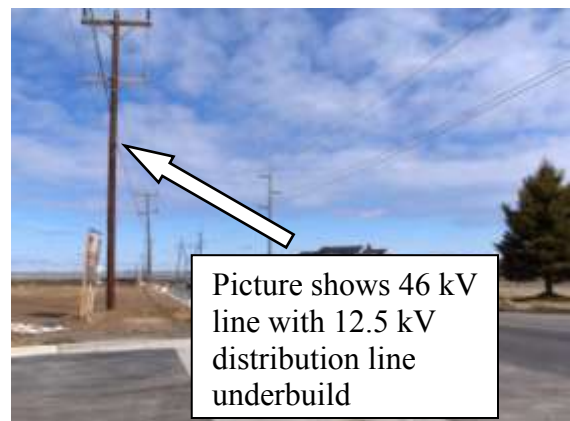
46 kV Transmission

tape color = white

Capacity = 40 MW

Cost ~ \$175k per mile OH
(plus ROW and permitting)

Single pole ROW ~ 50 ft



Substations Mapping Information

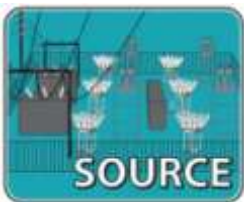
Distribution Substations



Need 7 new distribution substations
Land required: 2 to 3 acres
Load served: 40 to 80 MW
Cost each: \$2.5M to \$4M



Source Substations



Need 3 additional source substations
Land required: 5 to 10 acres
Load served: 400 to 600 MW
Cost each: \$7M to \$10M



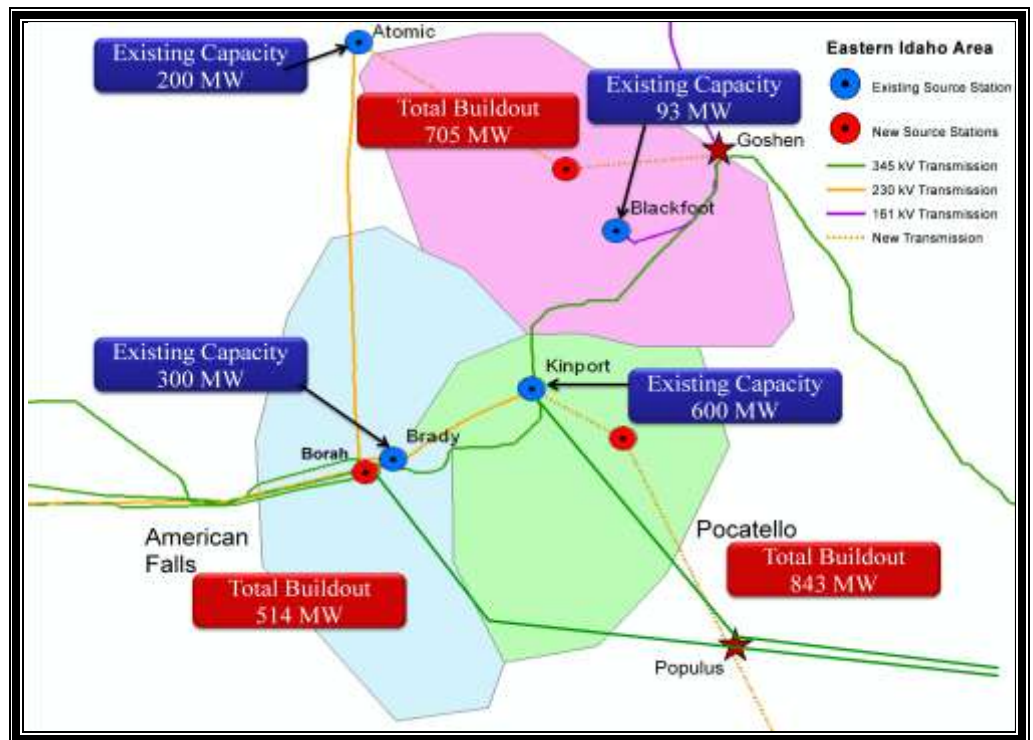
Eastern Idaho Buildout Requirements

Source Substations

- Additional source station capacity required in all three areas:
 - American Falls (Borah)
 - Pocatello
 - Blackfoot

High Voltage Transmission

- Each source station requires minimum of two high voltage transmission lines.



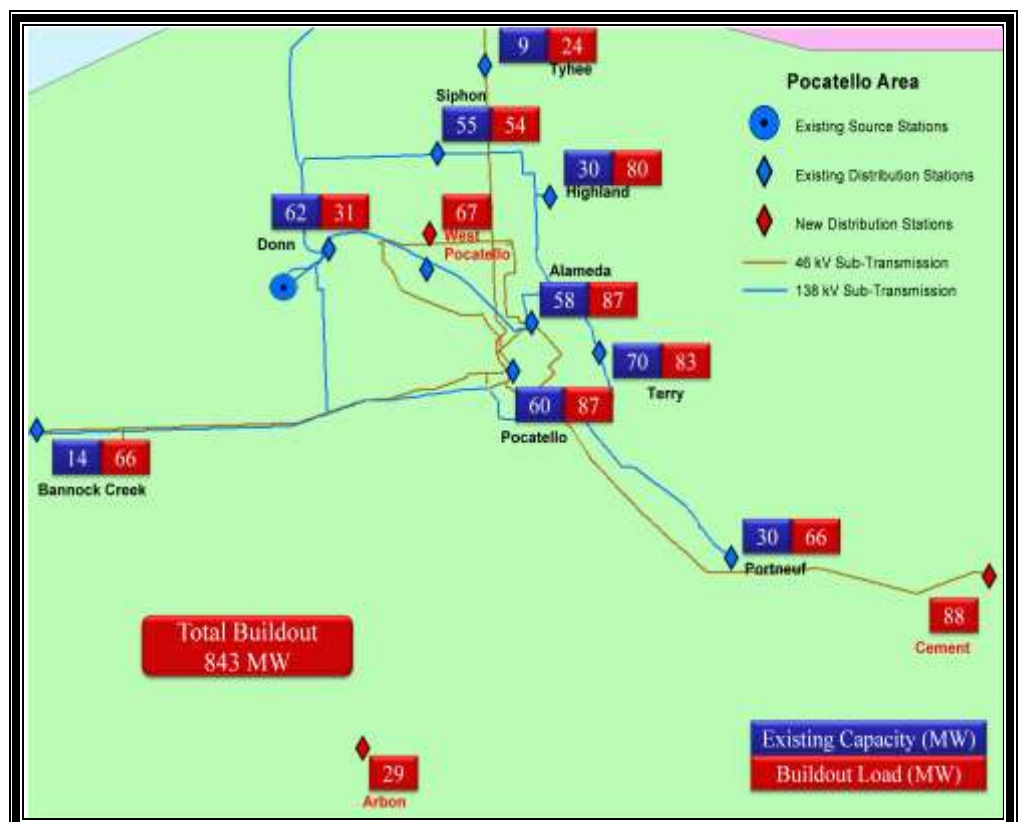
Pocatello Area

Distribution Substations:

- Three new Distribution Substations
 - West Pocatello
 - Cement
 - Arbon

Sub-Transmission:

- Three existing 138 kV lines (200 MW each)
- Need additional sub-transmission lines to serve 843 MW buildout
- Bring new sub-transmission out of source station(s)
- Connect three new distribution stations



Eastern Idaho Buildout Requirements

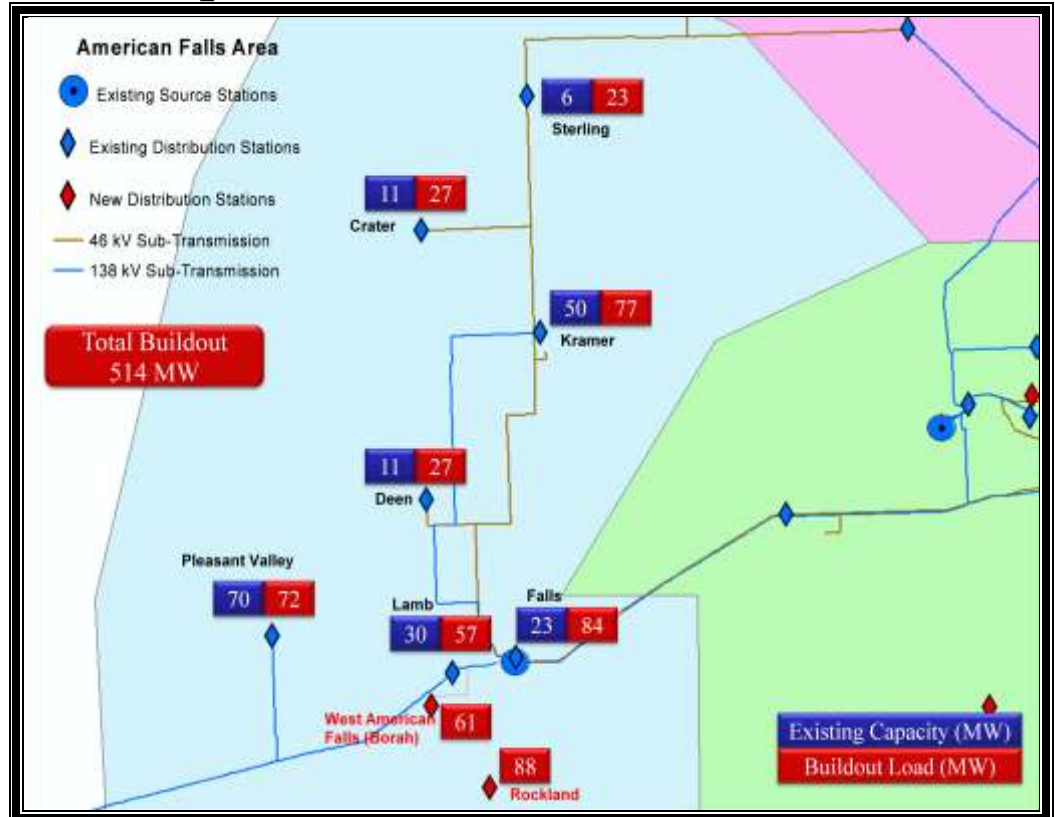
American Falls Area

Distribution Substations:

- Two new Distribution Substations
 1. West American Falls (Borah?)
 2. Rockland

Sub-Transmission:

- Two existing 138 kV lines (200 MW each)
- One existing 46 kV (40 MW)
- Need additional sub-transmission lines to serve 514 MW buildout
- Bring new sub-transmission out of source station(s)
- Connect two new distribution stations



Blackfoot Area

Distribution Substations:

- Two new Distribution Substations
 1. NW Blackfoot
 2. NE Blackfoot

Sub-Transmission:

- One existing 138 kV line (200 MW)
- Three existing 46 kV lines (40 MW each)
- Need additional sub-transmission lines to serve 705 MW buildout
- Bring new sub-transmission out of source station(s)
- Connect two new distribution stations

