Eastern Idaho Electrical Plan

Community Advisory Committee

Meeting #5
February 13, 2009

IDAHO POWER
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Meeting Agenda

8:00 a.m.	Welcome and Introduction
	Purpose of Meeting and Agenda
	Review CAC meeting #4
8:15 a.m.	Review Goals – *Mike Pepper*
8:30 a.m.	Mapping Guidelines / Alternative Development– *Bryan Hobson*
9:00 a.m.	Break
9:15 a.m.	Small Group Mapping
11:45 a.m.	Small Group Reporting
12:25 p.m.	Wrap Up
12:30 p.m.	Lunch – *Chartwells/ISU Catering*

Purpose of the Project

- To create a clear and documented electrical energy supply plan to serve the load needs of Idaho Power's Eastern Idaho region from now through buildout

  – *"The public process is the starting point of all electrical supply plans and any resulting* ***transmission*** *rights-of-way and* ***substation*** *siting requirements"*

Goals and Objectives

Mike Pepper
KMP Planning

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Overall Goal: Sustainability

- The development of the Eastern Idaho Electrical Plan is based on a shared desire for sustainability of both the electrical system and eastern Idaho communities.
- Emphasis was placed on the importance of safe, reliable and cost effective power that supports current and future community needs while maintaining the quality of the eastern Idaho physical and social environment.

Updated Goals

- **INFRASTRUCTURE AND SITING**
  - **Reliability: Provide reliable electric service to all Idaho Power customers in the Eastern Idaho service area**
  - **Design and Sustainability: Design electrical infrastructure and programs based on the most appropriate technology and to achieve optimum sustainability of the system**
  - **Siting: Site all new facilities to achieve optimal function and acceptable impact**
  - **Cost Effectiveness: Consider costs in all aspects of service, programs and new facilities development**

Updated Goals

- **ELECTRICAL SERVICE AND PLANNING**
  - **Conservation & Efficiency: Optimize the use of all appropriate current and new conservation and efficiency programs for the benefit of customers and Idaho Power operations**
  - **Planning: Conduct thorough and integrated planning activities when determining new infrastructure and programs**
  - **Political and Community Support: Plan and implement the EIEP to achieve and maintain optimum political and community support**

Reliability

1. Provide adequate system capacity (including upgrades) to satisfy N-1 conditions for main grid transmission throughout the eastern Idaho service area
2. 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
3. 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
4. Provide redundancy for industrial clusters
5. 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

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

Siting

- 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

- 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

Conservation and Efficiency

- Promote energy efficiency and conservation with local governments and with individual residential, commercial, industrial, and agricultural users
- Keep viable programs while seeking opportunities for enhancement and new programs
- Offer incentives for development and programs to encourage conservation and efficiency
- Encourage changes in customer habits to reduce energy use and future demand
- Increase education and marketing to let the public know about available programs
- Encourage partnerships and collaboration between Idaho Power and local governments and communities in developing, promoting and operating conservation and efficiency programs
- Maximize energy efficiency - Avoid new construction when possible when feasible

Planning

- Use existing local and federal plans as a guide in developing & implementing the EIEP
- Incorporate the EIEP into local comprehensive and resource management plans
- Keep local jurisdictions, governments and the public involved during planning and development
- Incorporate all appropriate generation sources (future INL and nuclear energy, alternative / renewable sources such as wind, manure, solar, etc.)
- Keep Idaho Power and the EIEP relevant to changing conditions
- Communicate across all energy providers where appropriate, consider total energy needs
- Encourage coordination and communication between Idaho Power, local governments, federal agencies and other affected organizations when scheduling planning processes, meetings, etc.
- Involve Idaho Power in local planning efforts as appropriate and feasible
- Coordinate with the tribe in the first stage of the planning process to address early, any cultural and sensitive tribal issues

Political Support

- Ensure as much as feasible, that everyone has a chance to be heard in the planning and development process
- Maintain transparency
- Encourage and establish priority within organizations for the EIEP and electrical service in eastern Idaho
- Be proactive when addressing the issue of electrical energy, keep the issue in front of organizations
- Encourage and foster an ongoing positive involvement of the media in this issue
- Build shared ownership between IPCO and local communities for the successful implementation of the EIEP

Mapping Guidelines

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Did you know?

The fear of the number 13 is called:

“ Triskaidekaphobia”

Someone with an irrational fear of Friday the 13th is called a:

“Paraskevidekatriaphobic”

Happy Friday the 13th!

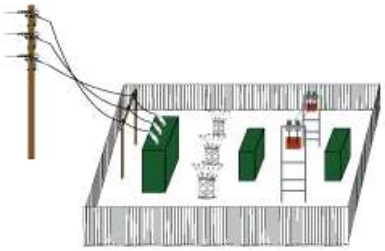
Eastern Idaho Buildout Summary

2000 MW

High Voltage Transmission

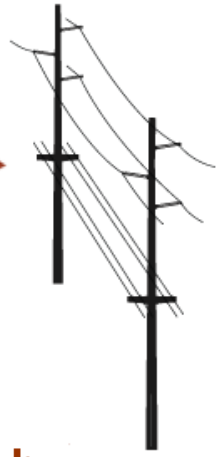
230 kV – 500 kV

Minimum 2 HV lines per source station



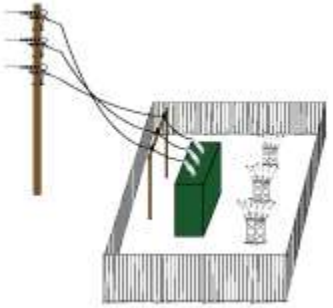
Source Substations

Additional Source Station Capacity in all 3 areas



Sub-Transmission

46 kV – 138 kV



Distribution Substations

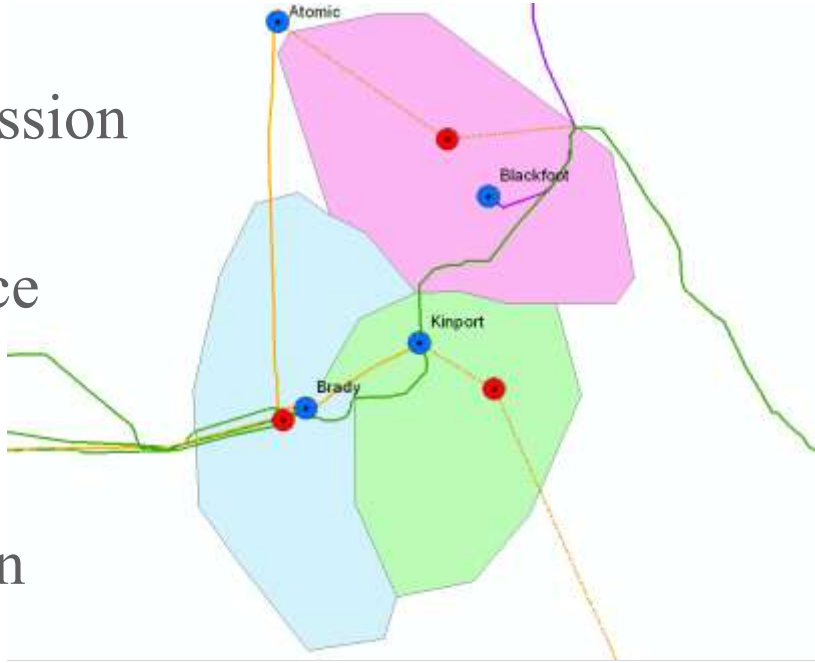
7 New Substations

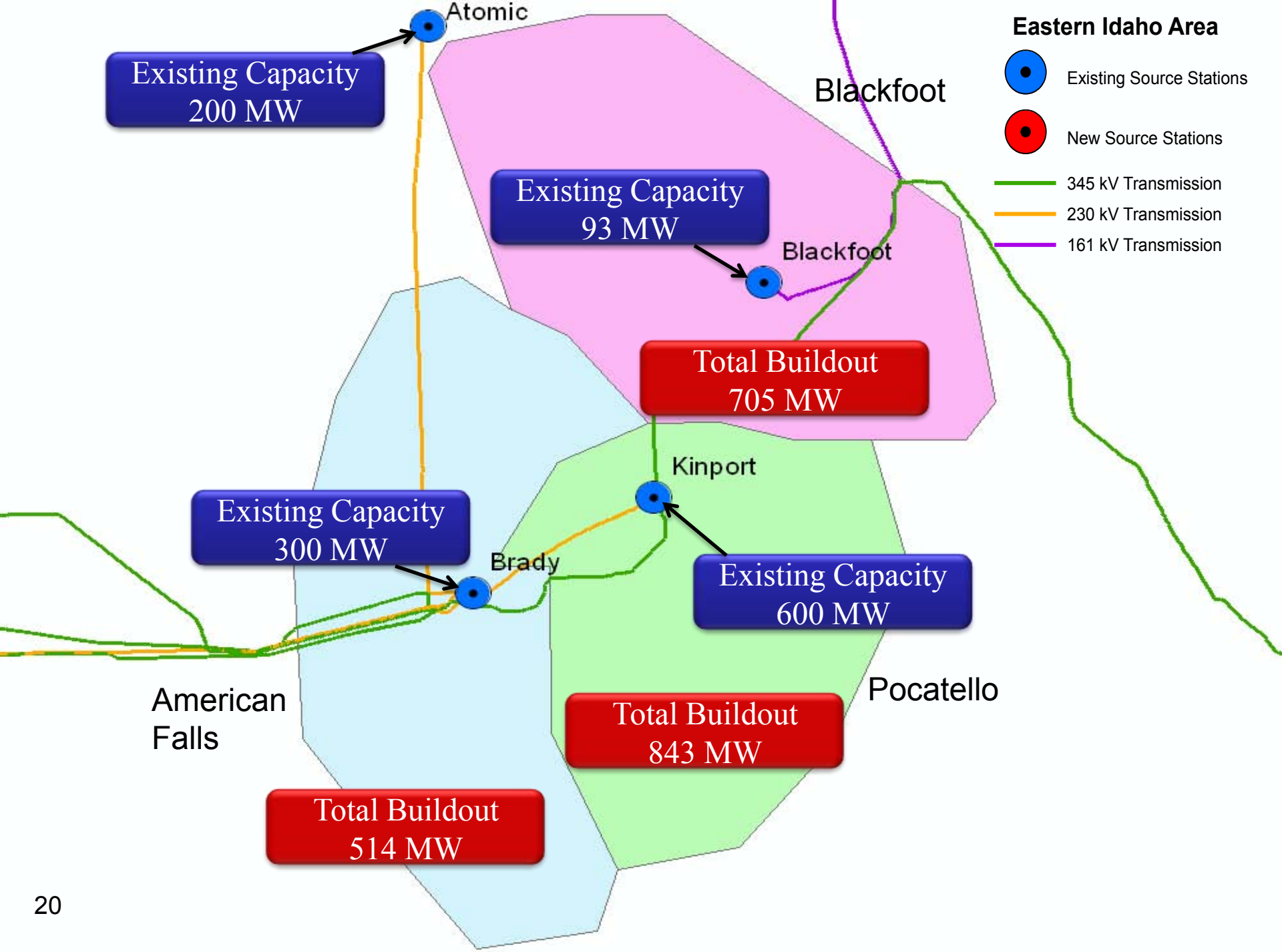
4 Step Committee Mapping Process

1. Site additional source station capacity
   - Additional source capacity required in all three areas (Pocatello, American Falls, Blackfoot)
2. Determine high voltage transmission line routes to/from source stations
   - 345 kV, 230 kV
3. Site 7 new distribution stations
   - Three in Pocatello area
   - Two in American Falls area
   - Two in Blackfoot area
4. Determine sub-transmission line routes to existing and new distribution substations

Source Stations

- Additional source station capacity required in each area (Pocatello, American Falls and Blackfoot)
- Minimum of two high voltage transmission lines to each source
- 2-4 sub-transmission lines out of source
- Options include:
  - New Site
  - Expand existing distribution station
  - Upgrade existing source station
  - Use existing transmission station




Eastern Idaho Area
Existing Source Stations
New Source Stations
345 kV Transmission
230 kV Transmission
161 kV Transmission
Atomic
Existing Capacity
200 MW
Blackfoot
Existing Capacity
93 MW
Blackfoot
Total Buildout
705 MW
Kinport
Existing Capacity
300 MW
Brady
Existing Capacity
600 MW
American
Falls
Pocatello
Total Buildout
843 MW
Total Buildout
514 MW

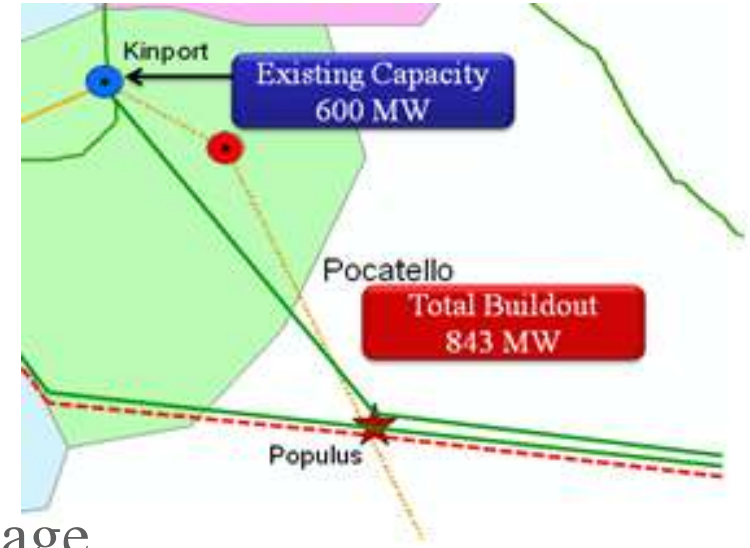
Surrounding Source Stations

- Populus Substation
  - Planned transmission station owned by Pacificorp
  - Near Downey, ID
  - Gateway West 500 kV project
  - Ties into existing 345 kV lines to Borah and Kinport
- Goshen Substation
  - North of Blackfoot
  - Source for Blackfoot 161 kV transmission line
  - Idaho Power owned 345 kV line from Jim Bridger terminates here

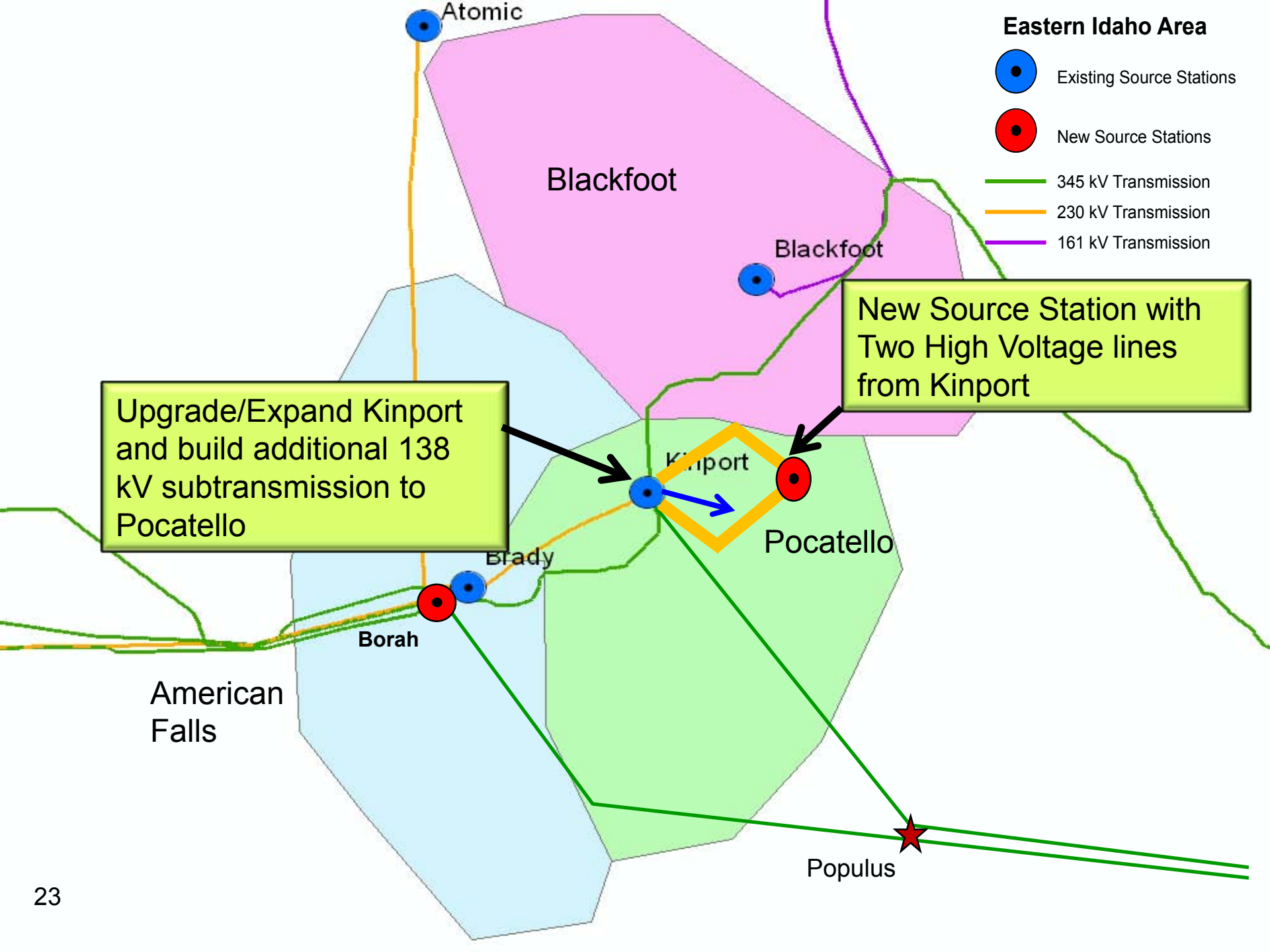
Both are potential options for new sources into Eastern Idaho

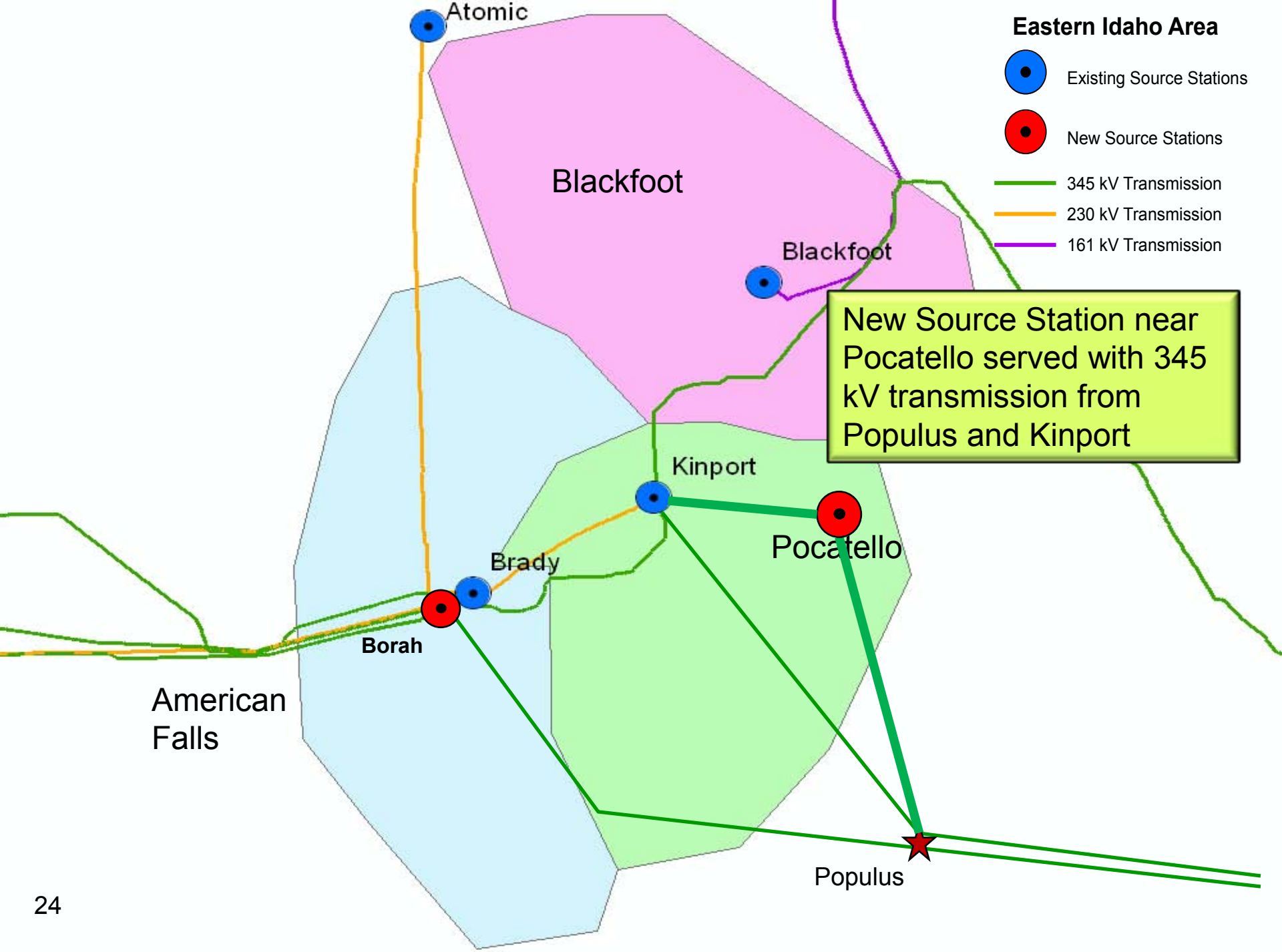
Pocatello Area Source Options

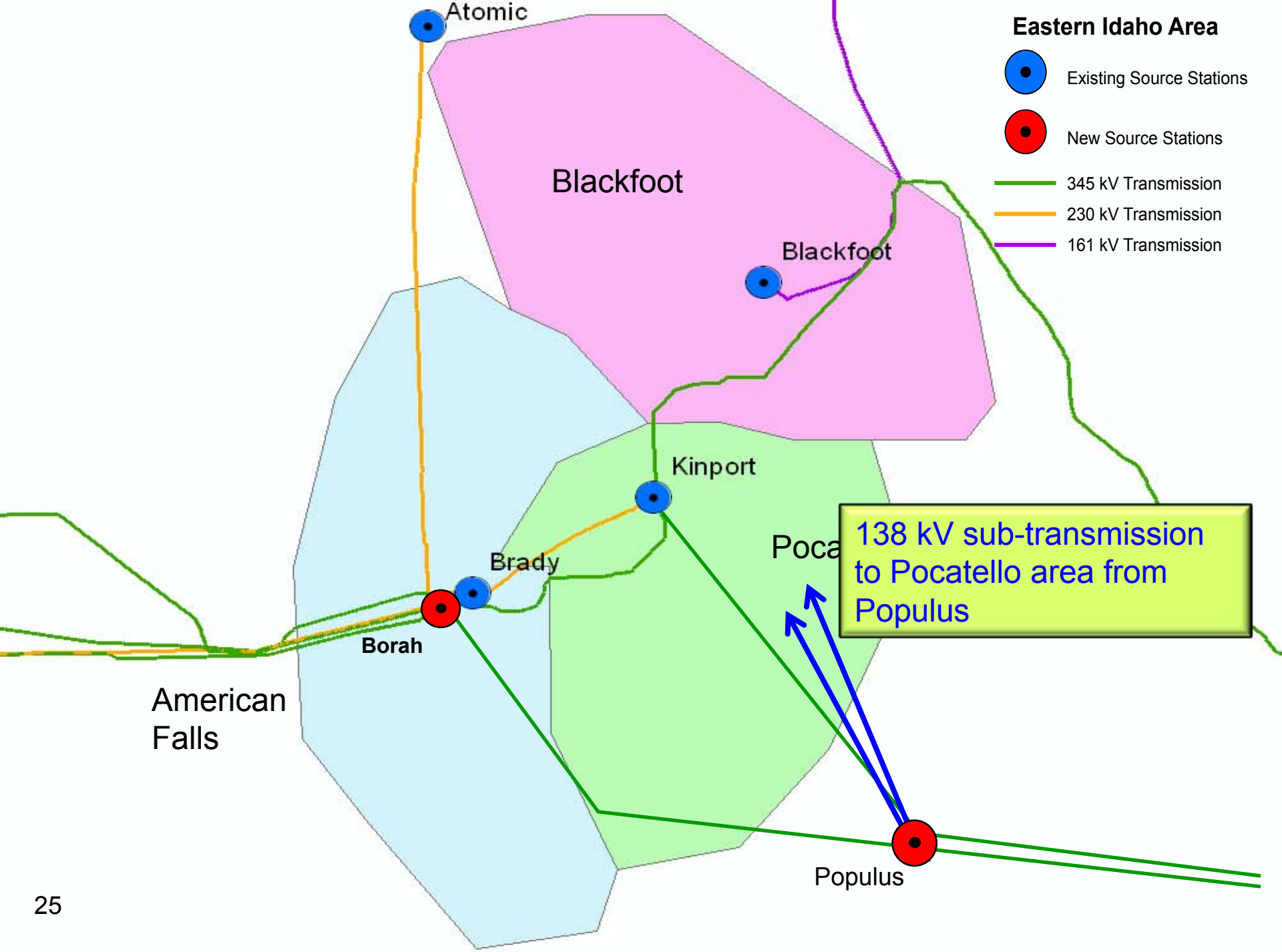
- Expand Kinport station
- New station near Pocatello
  - High voltage transmission from Populus?
  - Two high voltage lines from Kinport?
- Populus Station
- New station tapped off existing high voltage transmission line
- Expand/upgrade existing distribution station
- Others?

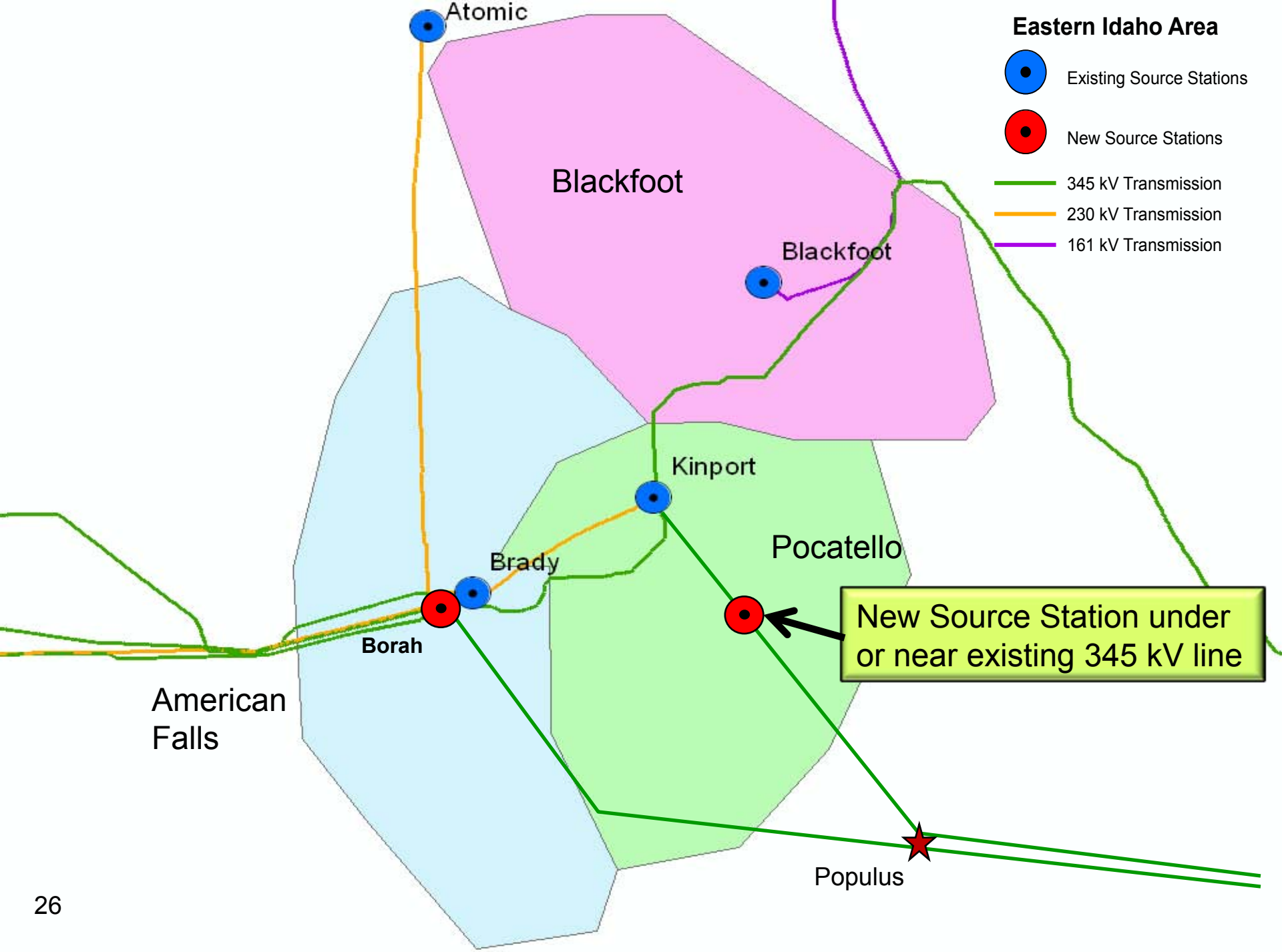


All must include additional 138 kV sub-transmission lines into the Pocatello area


Eastern Idaho Area
Existing Source Stations
New Source Stations
345 kV Transmission
230 kV Transmission
161 kV Transmission
Atomic
Blackfoot
Blackfoot
New Source Station with Two High Voltage lines from Kinport
Upgrade/Expand Kinport and build additional 138 kV subtransmission to Pocatello
Kinport
Pocatello
Brady
Borah
American Falls
Populus

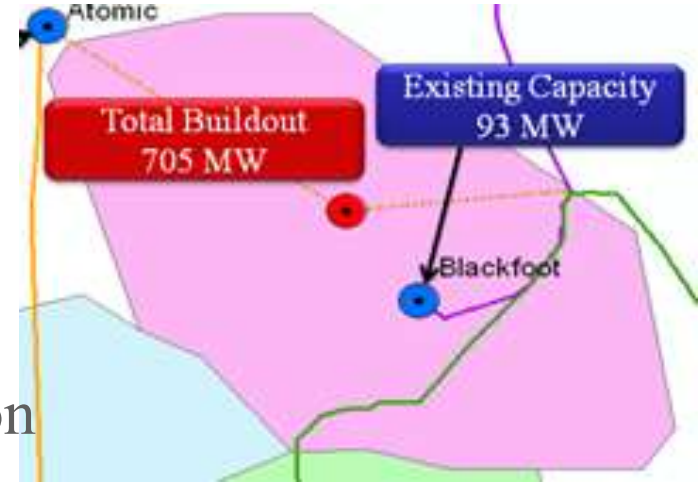

Eastern Idaho Area
Existing Source Stations
New Source Stations
345 kV Transmission
230 kV Transmission
161 kV Transmission
Atomic
Blackfoot
Blackfoot
New Source Station near Pocatello served with 345 kV transmission from Populus and Kinport
Kinport
Pocatello
Brady
Borah
American Falls
Populus


Eastern Idaho Area
Existing Source Stations
New Source Stations
345 kV Transmission
230 kV Transmission
161 kV Transmission
Atomic
Blackfoot
Blackfoot
Kinport
Brady
Borah
Poca
138 kV sub-transmission to Pocatello area from Populus
American Falls
Populus


Eastern Idaho Area
Existing Source Stations
New Source Stations
345 kV Transmission
230 kV Transmission
161 kV Transmission
Atomic
Blackfoot
Blackfoot
Kinport
Pocatello
Brady
Borah
American Falls
New Source Station under or near existing 345 kV line
Populus

Blackfoot Area Source Options

- New station near Blackfoot
  - High voltage transmission (345 kV) from Goshen?
  - Connect to existing 345 kV line?
- New station near existing 345 kV line
- Atomic Station (230 kV)
- Goshen Station (345 kV)
- Expand/upgrade existing distribution station
- Blackfoot substation - landlocked



Converting from one voltage to another (345kV:230 kV) requires transformers:

- $2 million - $4 million each
- 2-3 additional acres in substation

American Falls Area Source Options

- Add 138 kV source to Borah station
- Expand Brady station
- New station in American Falls area
- New station under existing high voltage line
- Expand/upgrade existing distribution station
- Others?

Helpful Facts – Sub-Transmission

When considering sub-transmission lines:

- Connect all distribution stations
- Lower outage risk with multiple lines to distribution station
- It's OK to serve distribution station with one sub-transmission line (radial line), but outage risk increases.
- Radial lines may be more practical for remote areas
- To reduce outage risk, we can "harden" or "overbuild" radial line
  - Steel poles vs. wood poles
  - Heavy duty construction
  - Additional 20% construction cost
  - Add 20-40% capacity (MW)

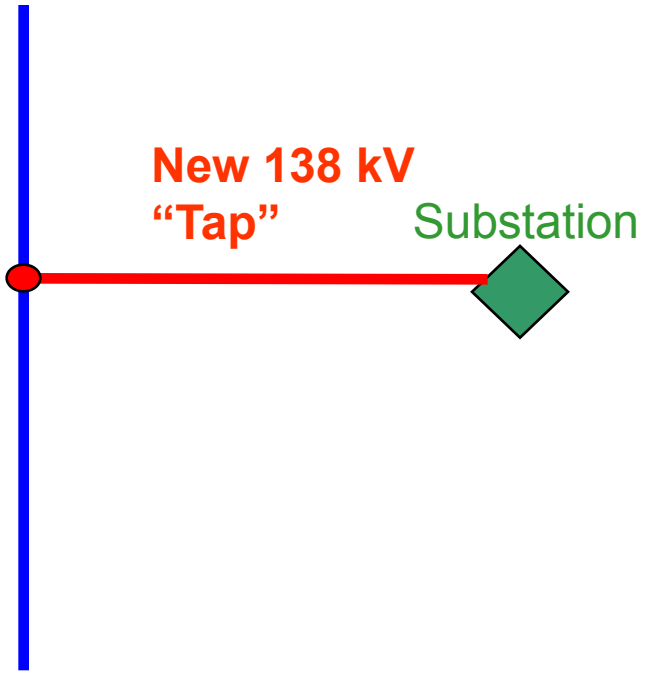
Connecting to Existing Sub-Transmission Lines

In most cases, we can connect a new sub-transmission line to existing line if same voltage.

Two options to connect new sub-transmission lines to existing lines

1. "Tap" the line

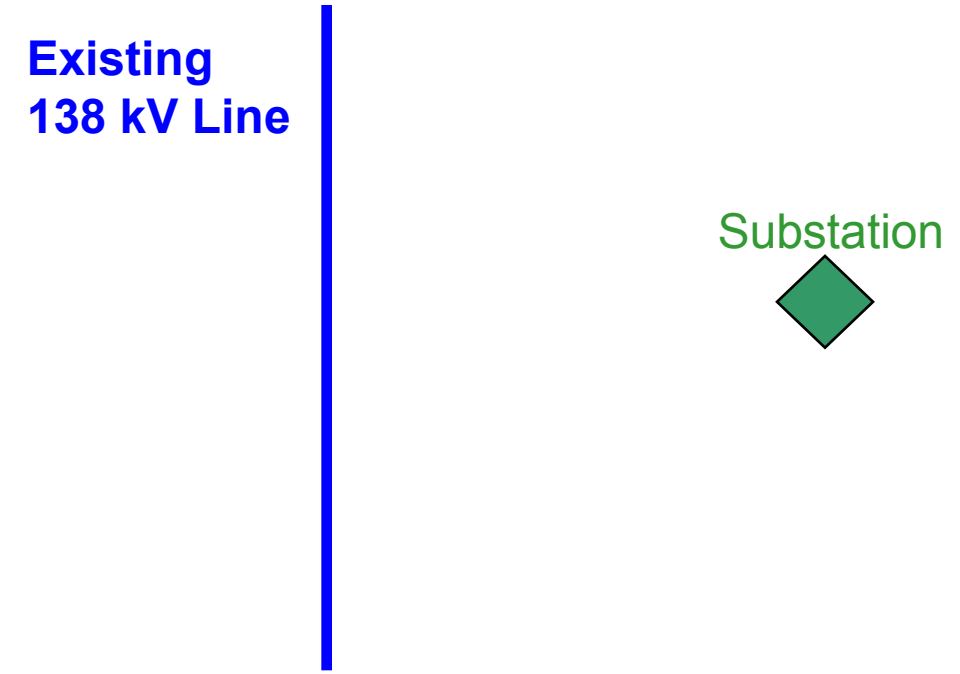
- Single or radial line "tap"
- Benefit: Less expensive, shorter lines
- Less reliable if no other line to new sub
- Must consider kW rating of existing line.



Connecting to Existing Lines

Can connect a new sub-transmission line to existing line if same voltage.

2. Double circuit, “In/Out”

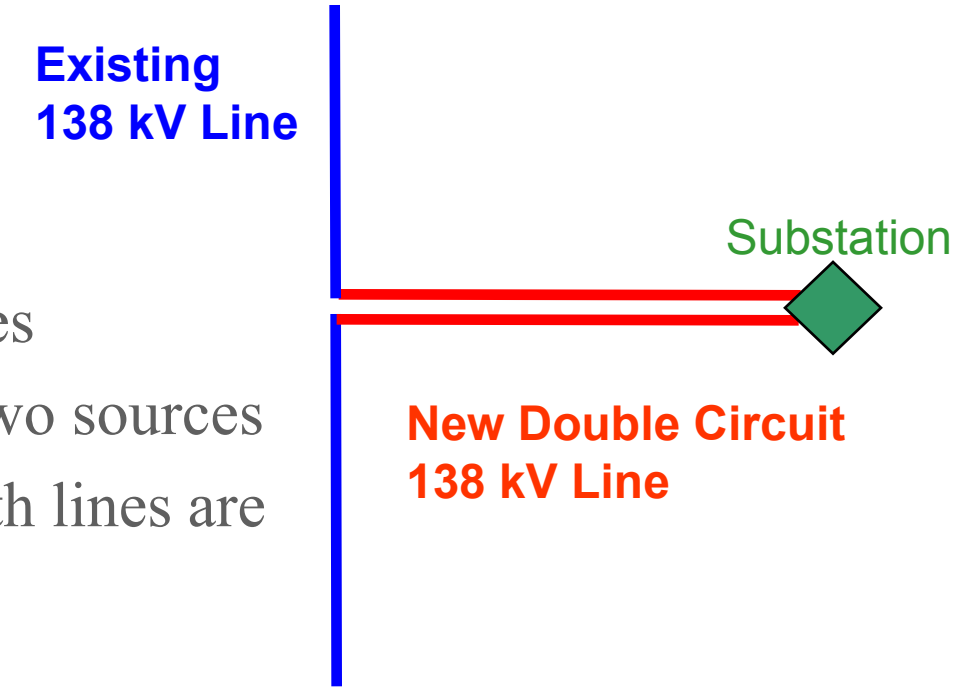


Connecting to Existing Lines

Can connect a new sub-transmission line to existing line if same voltage.

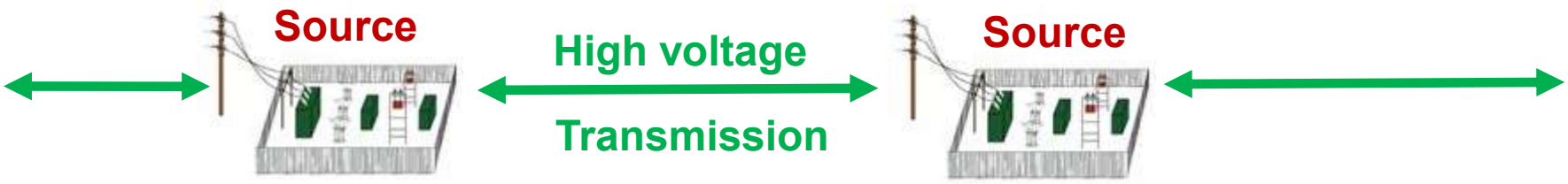
2. Double circuit, "In/Out"

- Two lines on common poles
- Must consider kW rating of existing line.
- Splits existing line into two lines
- Tradeoff: More reliable with two sources into substation, but some risk if both lines are on common poles



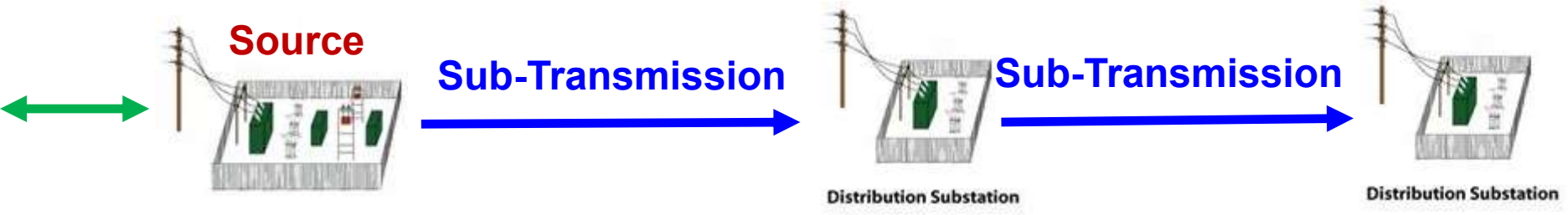
345 kV vs. 230 kV vs. 138 kV vs. 46 kV

345 kV and 230 kV connect to source stations



138 kV connects distribution stations to source stations

138 kV and 46 kV connect distribution stations together



Distribution Stations

- Near load centers
- Suggested location areas for new stations (yellow areas)
- Must have sub-transmission line(s) to distribution stations

Magic Valley Example

Source station

Serve with one 138 kV line?

Add second 138kV line to meet their Reliability goals

Also, to make redundant (or N-1 compliant) must overbuild first sections of each line from the sources

3x80 MW = 240 MW

Use larger wire to get 280 MW rating.

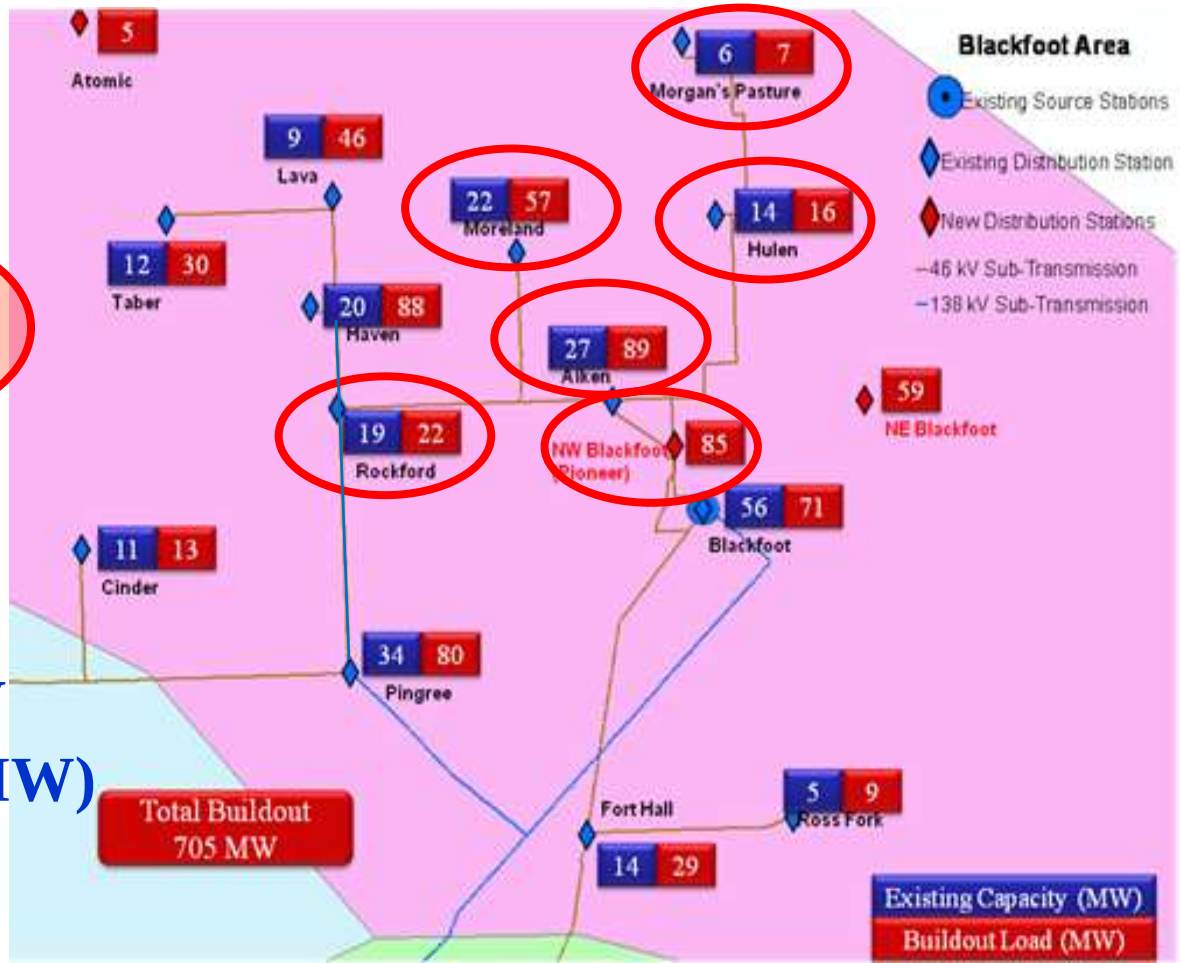
Existing Distribution on 46 kV System

- Additional capacity must be built into much of the area currently served by 46 kV system.

- Blackfoot Area Example

Aiken 89 MW
Moreland 57 MW
Rockford 22 MW
Hulen 16 MW
Morgan's Pasture 7 MW
NW Blackfoot 85 MW

276 MW



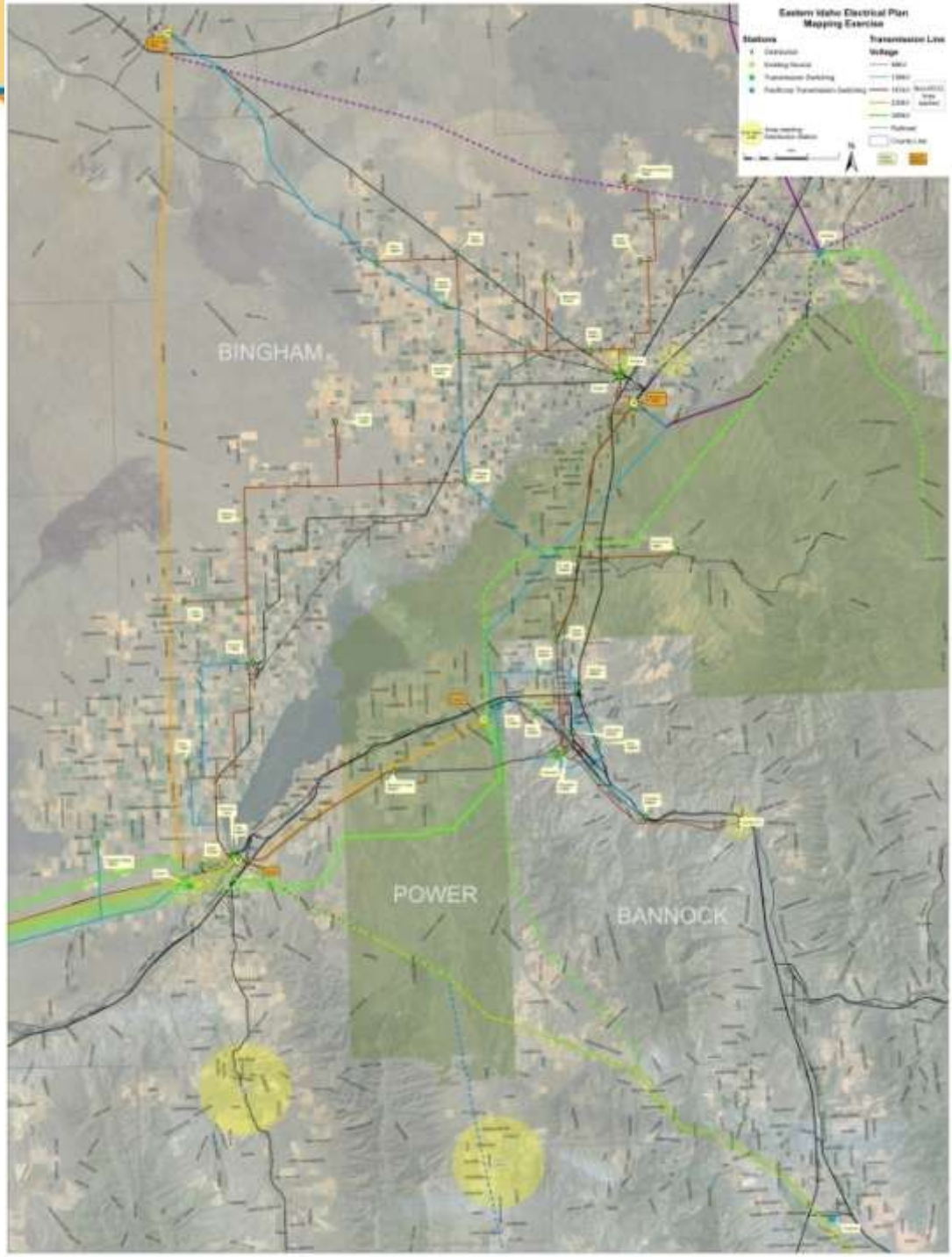
Options include:

- Upgrade **46 kV** to **138 kV**
- New **138 kV** lines **(200 MW)**
- Multiple **46 kV (40 MW)**

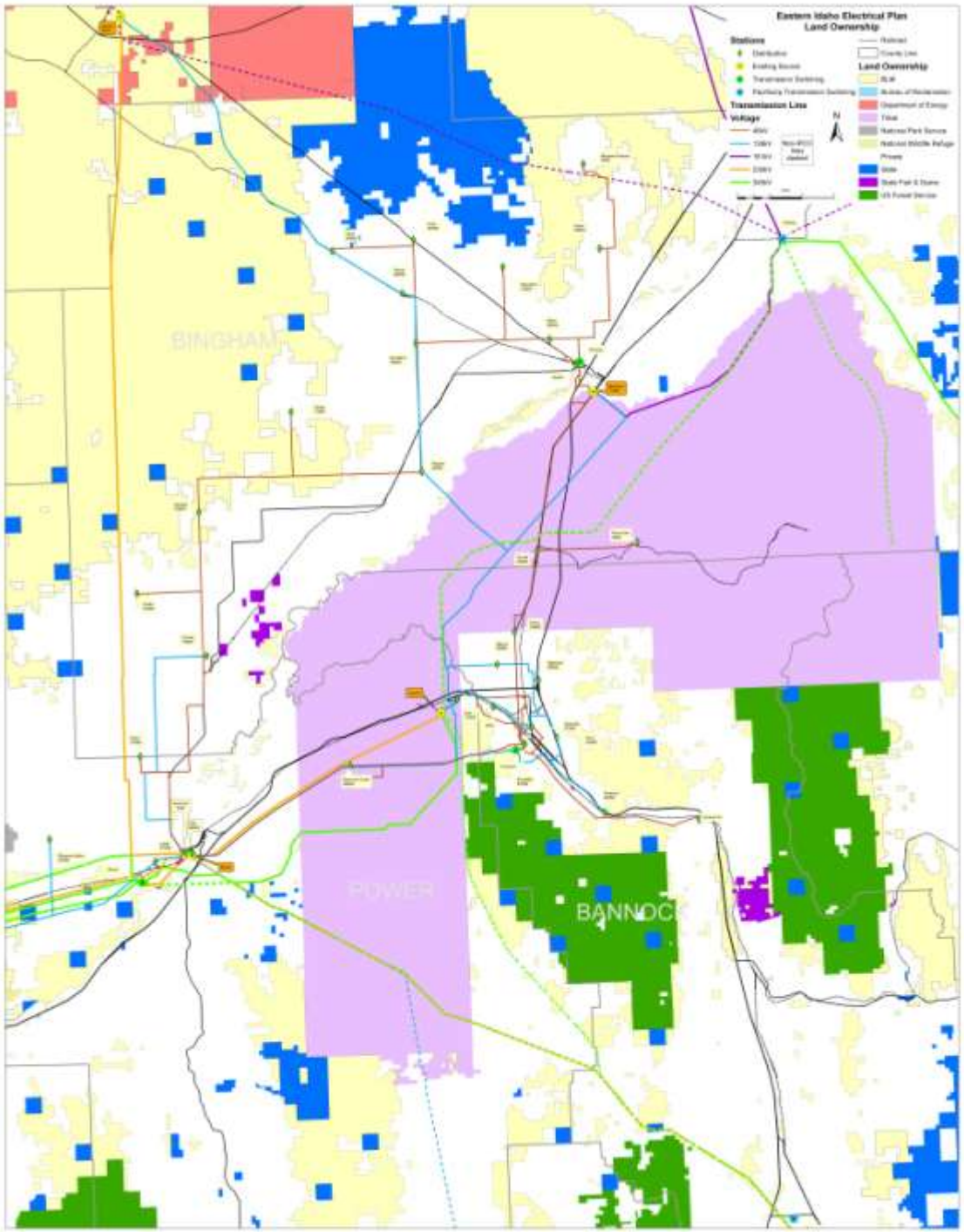
Mapping Tools

- Map
- Laminated handout
- Colored drafting tape
- Substation stickers
- Sticky notes
- Scissors, pens
- Flip charts – Make good, detailed notes on substation sites and line routes.

Map


Eastern Idaho Electrical Plan
Mapping Exercise
Stations
Transmission Line
Voltage
BINGHAM
POWER
BANNOCK

Property Ownership



4 Step Committee Mapping Process

1. Site additional source station capacity in each area
2. Determine high voltage transmission line routes to/from source stations
3. Site 7 new distribution stations
4. Determine sub-transmission line routes to existing and new distribution substations

Mapping Notes

- Refer to the mapping handout for guidance
- Follow the outlined steps
- Consider your Siting and Infrastructure goals
- Participate fully
- Discuss options – seek input from others as needed
- Make notes to describe details for each alternative (recorder)
- Use time between meetings to gather input from your organization
- Have fun

Mapping Small Groups

1	A. Ladd Carter
1	Michael Watson
1	Mori Byington
1	R.E. Bob Steinlicht
1	Robert Jensen
1	Roger Chase
1	Jeff Hammes
2	Blaine Newman
2	Brian Underwood
2	Ken Estep or Vicki Meadows
2	Mike Virtue
2	Richard D. Kirkham
2	Jim Johnston
3	Travis Stone
3	Brandon Bird
3	Larry Ghan or Steve Hadley
3	Sam Nettinga
3	Steven England
3	Lynne Schultz

4	Robert Chambers
4	Gynii Gilliam
4	Jake Evans
4	R. Scott Reese
4	Stephen Nelson
4	Sue Skinner
5	Stephen L. Love, PhD
5	Jim Mende
5	Matt Creamer
5	Matt Hunter
5	Scott Rasmussen
5	Steven Smart
5	Kristen Jensen

Small Group Mapping

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Next Month …

- Advisory Committee Meeting #6: March 13, 8:00 a.m.
  - Mapping alternative feedback
  - Continue small group mapping
  - Alternative scoring matrix