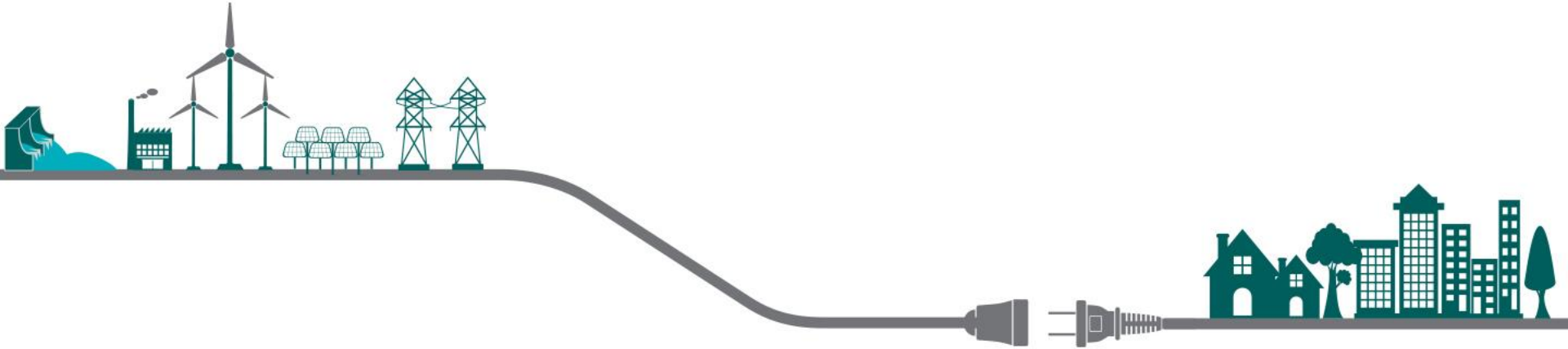


Idaho Power Distribution System Plans



UM 2005 – Workshop #2
February 12, 2020

Methods of Evaluating the Distribution System



Seasonal peak demand checks

Occur each spring and fall following seasonal peak demands



Small area studies

Power flow analyses of substations, transformers, and circuits to ensure sufficient capacity to serve future load (3-year rotation or as needed to serve new customers)



Electrical Plans

Long-term plans for substations and transmission, developed in consultation with community advisory committees (10-year intervals)



Protection coordination studies

Review of settings between distribution circuit protective equipment – relays, reclosers, fuses, etc. (5-year intervals unless triggered by large load or DER)



Fault analyses and power quality studies

Performed when needed for fault events or customer compliance verification with IEEE 519

Tools Used to Conduct Analyses & Develop Plans



- **Distribution modeling (DNV GL Synergi)**
Synergi simulates power distribution feeders, networks, and substations
- **Hosting capacity analysis (EPRI DRIVE)**
Used to determine distribution system's ability to integrate DERs feeder-by-feeder
- **Time-series analysis (EPRI OpenDSS)**
Power system simulation to explore capabilities and limitations of distribution system
- **DER modeling (NREL SAM, SNLGridPV)**
SAM calculates performance and financial metrics of renewable energy systems;
GridPV simulates integration of distributed generation
- **Sub-transmission modeling (PowerWorld Simulator)**

DSP's Relationship to Other Idaho Power Plans and Reports



- **IRP:** DSP informs the calculations of T&D deferral value included in EE cost-effectiveness test, and T&D deferral value of distributed energy in IRP resource stack.
- **Smart Grid Reports:** Small area studies identify capacity constraints. When those constraints can be cost-effectively addressed with non-wires alternatives, they may be included in the Smart Grid Report (Example: Jordan Valley Energy Storage/Microgrid)
- **Transmission local planning:** Electrical plans produced from distribution system planning directly inform the need/location of transmission lines and substations. Small area studies inform timing of transmission system capacity additions.
- **Interconnection studies:** Distribution plans are evaluated when generation developers request interconnection to a distribution circuit.

Plans: Non-Wires Solutions



- Non-wires projects assessed against traditional solutions. Decision making based on cost-effectiveness.
- Non-monetized benefits considered: Experience with new solutions, future flexibility, customer satisfaction
- *Example:* Jordan Valley – battery solution to shift peak demand was determined to be a cost-effective way to address a capacity constraint

Plans: DG/DER



- **Integration:** Idaho Power implemented software and processes for analyzing DER integration requests to ensure safe and reliable circuit operation within parameters
- **Locational DER assessments:** T&D locational capacity deferral value analysis through Resource Value of Solar proceeding
- **Hosting capacity analysis:** DRIVE model used to calculate hosting capacity at the feeder level with system-wide hosting capacity analysis completed in 2019

Plans: Smart Inverters



- Idaho Power plans to require smart inverter installations with DER integration consistent with the yet to be finalized IEEE 1547 standards
- Smart inverter use will allow for additional DER penetration