WORKSHOP · WED, OCT 14 · 2:30-3:30 PM

From Curiosity to Construction: The Mountain Town TEN Playbook

Matt Garlick, CEO, The GreyEdge Group; Megan Lim, Education & Business Development, The GreyEdge Group

Thermal energy networks (TENs) link buildings on a shared ambient water loop so heat pumps can trade heat and tap sources like boreholes, wastewater and waste heat. GreyEdge explained where they pencil out in mountain towns and why deciding who pays, owns and operates must come first.

KEY TAKEAWAYS

1. **A TEN is a heat pump system, not a geothermal one.** It finds the least-cost energy: wastewater, mine water, ice arenas, snowmaking lines, lakes. Boreholes work almost anywhere but are often the priciest source.
2. **Pick dense, diverse, water-based buildings.** Big loads close together, a mix of heating and cooling, and hydronic systems make a TEN cheaper. Electric resistance buildings are costly to convert.
3. **Federal credits can make it the lowest-cost option.** The federal tax credit returns 30 to 50% of geothermal cost with no cap; plan on about 40%. Colorado adds state grants and credits.
4. **Governance stalls more projects than engineering.** Over 70% of evaluated projects never reach construction because no one settles who finances, owns and operates the system.
5. **Count the value, not just the ROI.** Stable costs, cooling during smoky summers, lower grid peaks, avoided gas mains and less maintenance all belong in the value stack.

WHAT LOCAL OFFICIALS CAN DO

- ☐ **Start the governance conversation before feasibility.** Decide whether the town, utility or a third party pays, owns and operates.
- ☐ **Inventory your thermal assets.** Map loads plus wastewater lines, treated effluent, ice rinks, breweries and snowmaking intakes.
- ☐ **Do a hydrogeology study, then drill a test borehole** to measure deep earth temperature, conductivity and diffusivity before design.
- ☐ **Retro-commission buildings first** so you design for less load. Lower supply temperatures (around 135°F) suit heat pumps.
- ☐ **Time it with boiler replacement,** and check each building's electrical capacity.
- ☐ **Require certified geo designers and inspectors in RFPs,** hire drillers with mountain experience, and plan around short drilling windows.

BY THE NUMBERS

30 to 50%
Federal tax credit for geothermal, no cap

300 tons
Capacity where TENs often start to pencil out

70%+
Evaluated TEN projects that never reach construction

12 yrs
Average delay from concept to shovel-ready

~1M gal/day
Vail's treated effluent, at 55 to 65°F

12.5%
Pump power at 50% speed; design for part load

WATCH OUT FOR

- ! Value engineering can cripple a system: cutting a valve or downsizing a pump may save $100,000 now and cost millions over 50 years.
- ! How to bill for heat moving both ways (a lab rejecting heat, an office using it) is still unsolved and must be worked out in governance.

RESOURCES

The GreyEdge Group
greyedgegroup.com

HEET
heet.org (TEN background and research)

Colorado Energy Office
Geothermal Energy Grant Program and state geothermal tax credit

Peer models
Framingham, MA (Eversource utility TEN); Hayden, CO (town thermal utility)

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CONTACTS

Matt Garlick
CEO, The GreyEdge Group

Megan Lim
Education & Business Development, The GreyEdge Group