
MT2030
CLIMATE
SUMMIT
SUN VALLEY 26
PRESENTED BY TORUS

Turning Clean Energy Ambition into Implementable Projects



Sustainability | Energy Strategy | Facilitation

www.GoSTRAVEN.com

Deb LaSalle, J.D.

Founder & Principal Energy & Sustainability Strategist

Integrated Sustainability Team

Energy and Emissions Analysis

Assess and visualize energy and emissions across fleets, buildings, and infrastructure to develop baselines and inform data-driven decision-making.

- Energy & emissions audits and inventory modeling
- Dashboard development
- Benchmarking, M&V

Strategic Decarbonization

Create actionable decarbonization roadmaps with measurable targets, timelines, and cost-benefit analyses to guide long-term strategies.

- Interval data analysis
- ROI, payback, & co-benefits
- Roadmap development
- Capital & utility coordination

Climate Planning & Adaptation

Identify climate vulnerabilities and integrate resilience strategies into energy and infrastructure planning to safeguard services and people.

- Vulnerability assessment
- Scenario planning
- Adaptation strategies
- Resilience co-benefits

Clients We Serve

- Cities and public agencies
- K–12 schools and universities
- Commerce and industry

Sustainability Reporting

Compliant, clear, accessible public-facing reports, presentations, and interactive visuals that support decision-making and community engagement.

- Graphic-rich reporting
- Data visualization
- Clear messaging
- Progress tracking

Stakeholder Engagement

Interactive workshops that surface cross-departmental and partnership insights, generate alignment, and build momentum.

- Staff workshops
- Facilitation & synthesis
- Priority alignment

Waste Reduction & Management

Evaluate solid waste, water, and operational materials systems to optimize resource use and identify cost-saving strategies.

- Waste audits
- Reduction strategies
- Circularity planning

STRAVEN TEAM









Deb LaSalle, JD.	RT Williams, PhD, CEM	John Gardner, PhD, PE	Zach Bell, BA Environmental Science
Sustainability Consultant ➢ Energy efficiency and feasibility studies ➢ Sustainability strategy and implementation ➢ Strategic planning and stakeholder alignment	Certified Energy Manager ➢ Building performance and energy systems engineer ➢ Energy modeling, forecasting, and analytics ➢ Utility incentive strategy and anomaly detection dashboards	Senior Engineer ➢ Professor emeritus of mechanical engineering ➢ 60+ peer-reviewed research publications, 3 textbooks, 3 patents ➢ 130+ industrial energy assessments	**Data Analyst** ➢ ESA Credential I energy and sustainability analysis ➢ GHG accounting and benchmarking ➢ Data visualization and systems evaluation

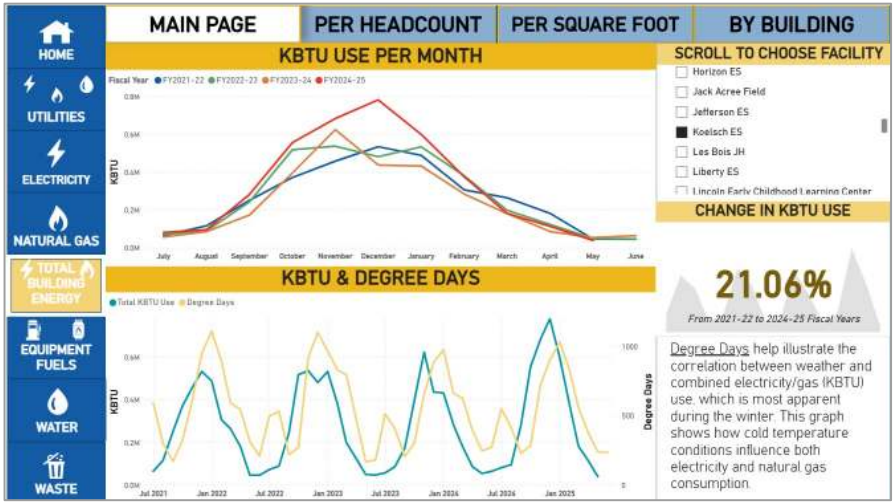
Taking Clean Energ from Ambition to Implementation

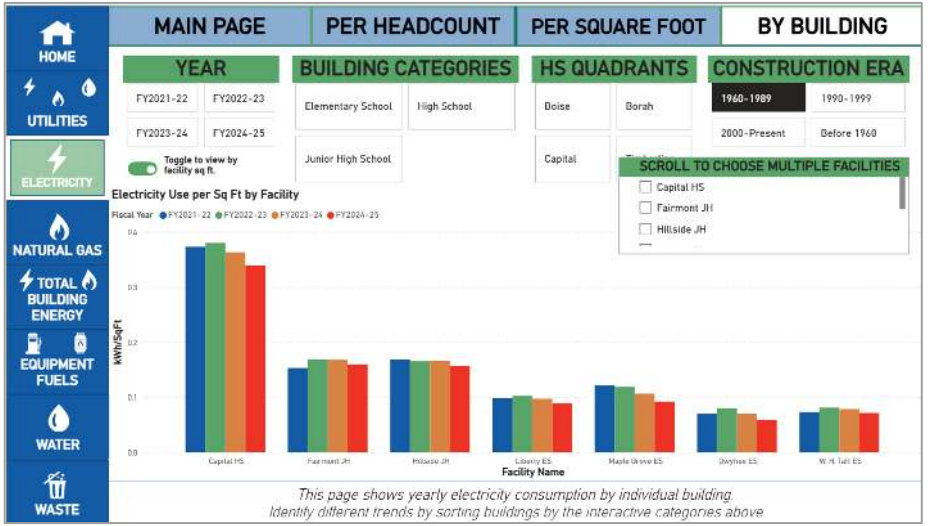


Understand the system before choosing projects



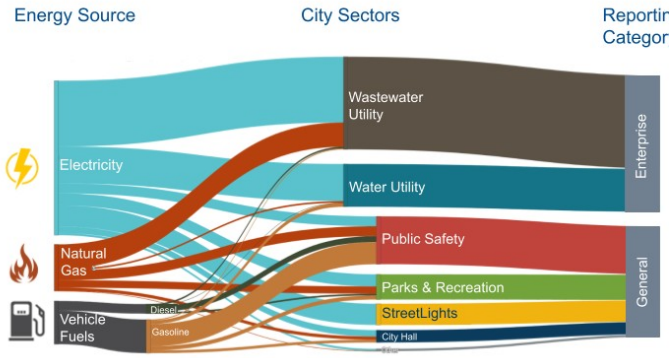
Understand Systems Before Prescribing Solutions





Understand Systems Before Prescribing Solutions

2024 City Energy Flow



Public Safety facilities and fleet expansion sharply increase both electricity and fuel use—new fire stations and the police fleet are the primary contributors.

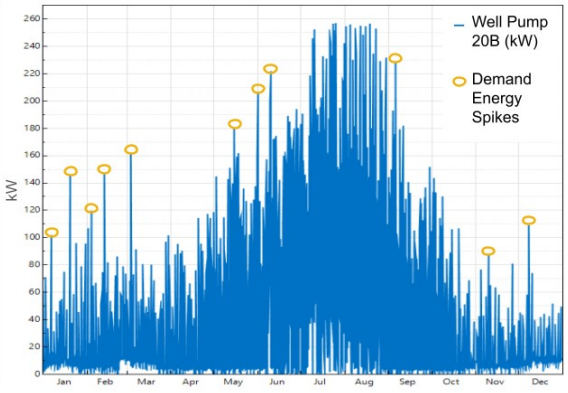
Vehicle fuel use is rising 4–7% annually, driven by population growth, increased service demand, and an aging fleet with lower fuel efficiency.

Water Utility ECM Highlight

Reduce Well 20B Demand Charge Exposure

Well 20B experiences periodic demand spikes that disproportionately increase Annual electricity demand charges.

Adjustments to pump sequencing, pressure setpoints, and control strategies could reduce peak demand, generating recurring savings while reducing stress on pumps and electrical equipment.

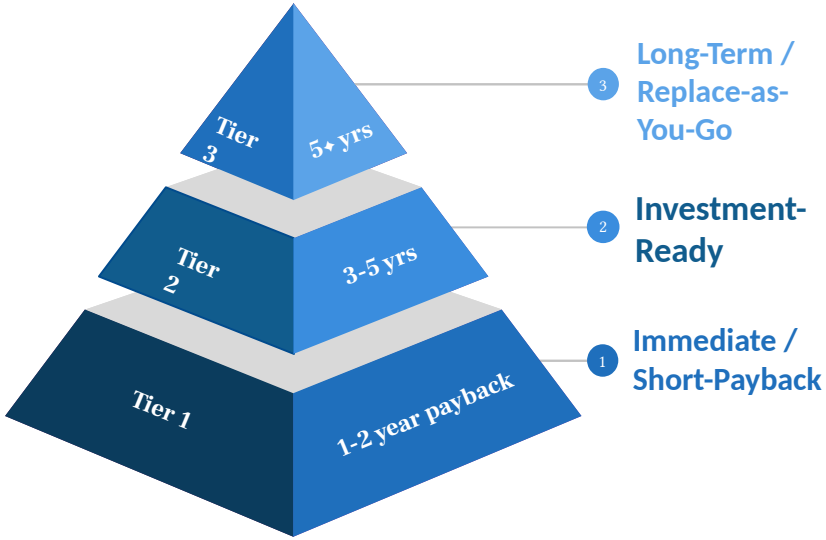


Where should you invest?



Energy Strategy Plan

Categorize opportunities into tiers based on cost, payback, and implementation complexity.



Tier Focus	Representative Actions	Investment Range	Annual Savings	Ongoing
2027 — Operational Optimization and Near-Term Efficiency				• Continue streetlight and building LED upgrades *(funded through existing capital program)* • Ongoing monitoring and verification • Annual fleet transition assessment and implementation (hybrid and EV adoption where appropriate) • Replace appliances with commercial-grade Energy Star® as needed
Implement Priority Tier 1- 2 Measures + Solar Feasibility Screening	Building automation system (BAS)/ direct digital control(DDC) optimization, energy dashboards, utility bill review, HVAC and pump scheduling, demand management, and operational best practices, with Tier 1-2 facility improvements; complete solar photovoltaic (PV) feasibility screening to support incentive timing	$60–$200k	$190k–$205k	
2028 — Complete Operational Measures				
Complete Tier 1-2 Measures + Conduct GSHP & Irrigation Feasibility Studies	Adopt project owner requirements and procurement policies; implement SCADA/EMS-based monitoring and control refinement, operator-driven optimization, and enhanced performance visibility; and conduct feasibility studies for ground source heat pumps (GSHPs) and smart irrigation.	$30–$160k+	$100k+	
2029+ — Implement Capital Improvements				
Implement Approved Tier 3 Capital Projects	Implement capital improvements aligned with feasibility study results and asset replacement cycles, including solar PV and GSHP deployment, smart irrigation and control upgrades, retro-commissioning and major HVAC improvements, and utility system optimization through equipment upgrades, load shifting, and expanded EMS integration.	Aligned with capital replacement cycles $200k+	$20k-600k+ (long-term)	

Heat Pump Heater/Chiller ROI (Return on Investment)



BOISE SCHOOLS EST. 1881 Sustainability
Environmental
Educational
Economic



Assumptions:

Electricity Escalation

- 7%
- 5%
- 2.5%

Natural Gas Escalation: 2%

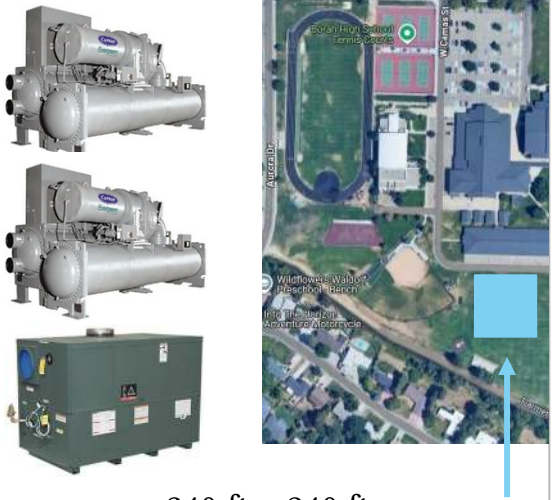
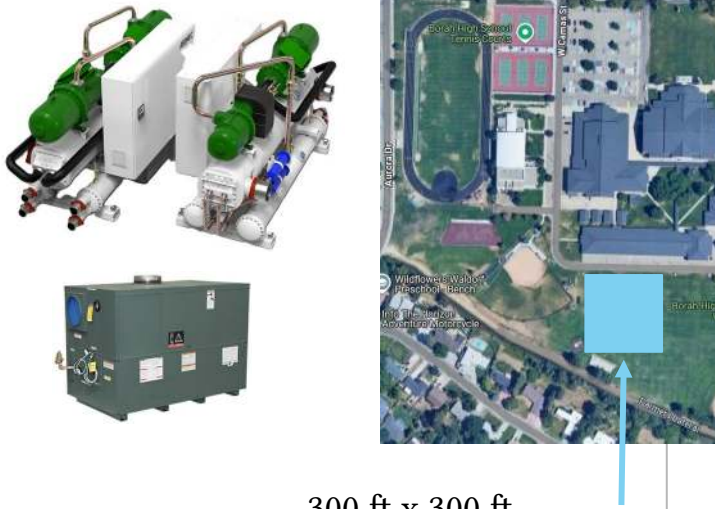
Incremental CAPEX Estimates (costs above proposed baseline system)

- High CAPEX (20% Contingency)
- Low CAPEX (30% Direct Pay)

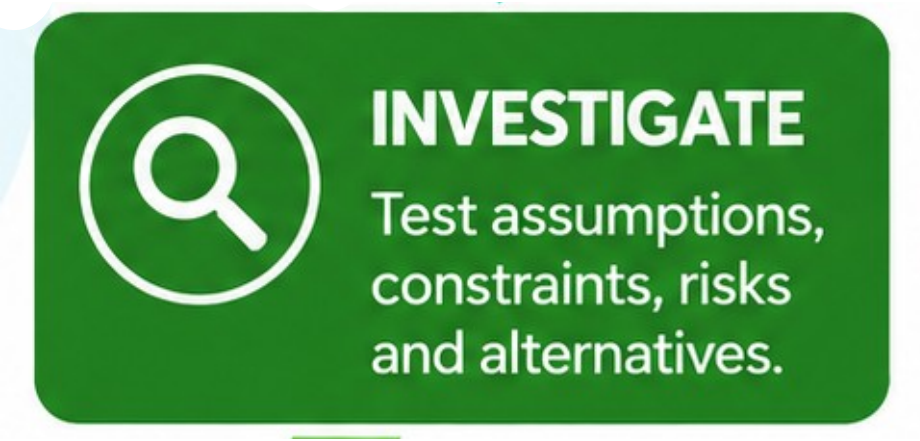
Comprehensive Feasibility & Alternatives Analysis

Borah High New & Old Gym Complex: Heating/Cooling Equipment Options

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Air-Cooled	Water-Cooled	Heat Pump
• **Two 230 ton Air-Cooled Chillers**, operating when air conditioning required • **Update Boiler for New Gym** (Old Gym Complex recently completed)	• **Two 230 ton Water-Cooled Chillers** • **340 ton capacity ground source heat sink** • **Update Boiler for New Gym** (Old Gym Complex recently completed)	• **Two 230 ton Heat Pumps** using the ground as a source for heating and a sink for cooling • For heating the New Gym Complex • For cooling the New & Old Gym Complexes • **Update Boiler for New Gym** to use as backup.
	 240 ft x 240 ft underground borehole field	 300 ft x 300 ft underground borehole field

When resistance = opportunity



Don’t Overcome Resistance Before you Understand It

Objections → Design Criteria

NAYSAYERS HELP DEFINE A BETTER PROJECT

COMMON OBJECTIONS		DESIGN CRITERIA
	"It's too expensive."	 Meet lifecycle cost and payback targets.
	"It's too complex to operate."	 Be reliable, maintainable and within staff capacity.
	"It won't work here."	 Perform in local conditions and site constraints.
	"It won't reduce emissions enough to matter."	 Achieve measurable energy and carbon reductions.
	"The community won't support it."	 Address community, resiliency and equity goals.

Find the Capital Moment



Cooling Needed Now

- **Classrooms** and common **spaces** overheating
- **Impacts** learning conditions and performance
- **Must address** in near term

+

Future Heating Reinvestment

- Boilers and heating systems nearing end of life
- Significant reinvestment required in coming years
- Opportunity to align with decarbonization goals

=

Integrated Opportunity

- **Meet** near-term cooling needs
- **Plan for future** heating **replacement**
- **One** integrated, efficient solution
- Lower lifecycle cost and **emissions**

Borah HS Gym:
Cooling ✦ Heating Strategy Comparison

BOISE SCHOOLS EST. 1881 | Sustainability
Environmental
Educational
Economic

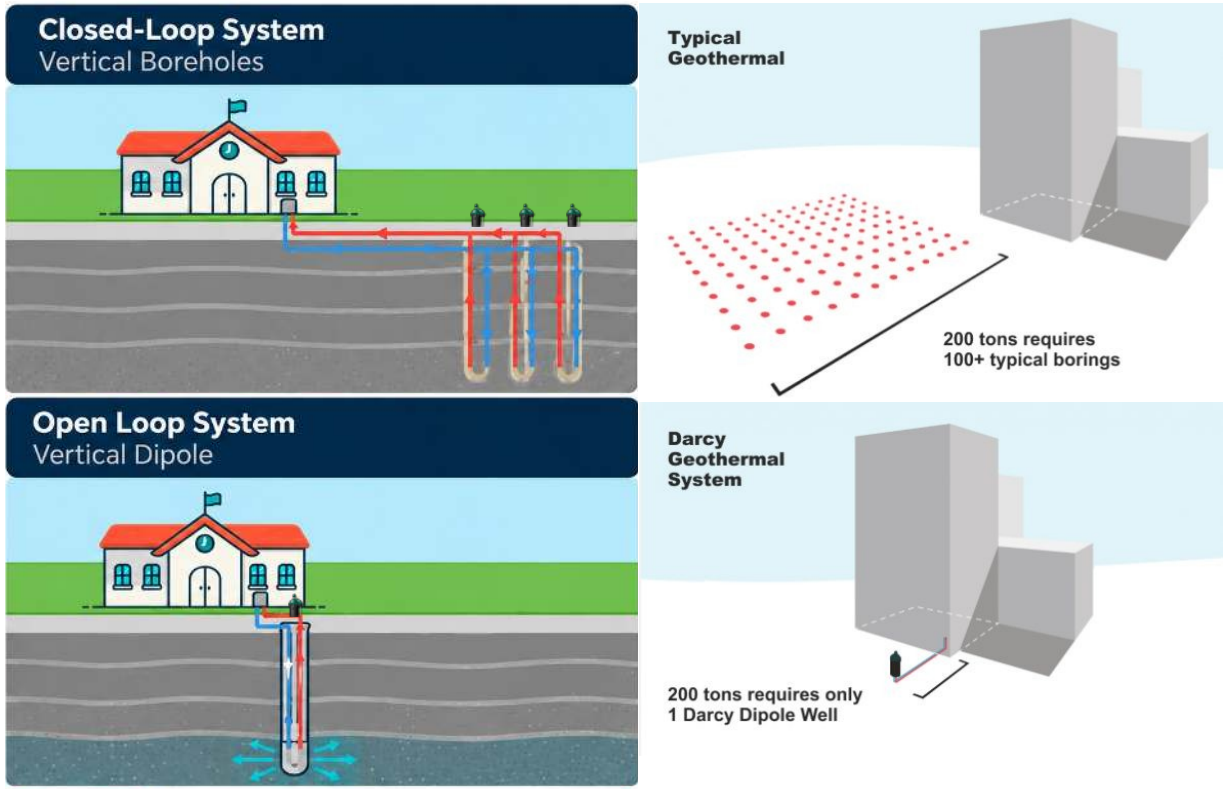
Metric	Air-Cooled ✦ Boiler	Water-Cooled ✦ Boiler	Heat Pump (HP) Heater/Chiller
	• Two 230 ton Air-Cooled Chillers • Boiler for New Gym 	• Two 230 ton Water-Cooled Chillers ground source heat sink • Boiler for New Gym 	• Two 230 ton HP using the ground as a source for heating & a sink for cooling 
Upfront Capital Cost Includes system, building upgrades, electrical, piping, & install Excludes 20% contingency specified by Musgrove Engineering	**$6.3M** ($3.5M boiler | $2.8M chillers)	**$9.0 M** ($3.5M boiler | $2.75M boreholes | $2.75M water-cooled system)	**$9.7M** ($3.4M HP | $2.75M boreholes | $3.5 for HP mods) (additional piping needed)
		Includes: -**Redundancy:** Borehole field sized 460 tons; could downsize to 360 tons. -**Idaho Power incentives:** For more high-efficiency cooling system components **Supports expansion for future expansion for heating and cooling**	
Direct Pay Rebate Check	**$0M**	**$2.0M**	**$2.7M**
Incremental Cost	**$0M**	**$7M**	**$0.7M**
First Year Annual Energy OpEx (A/C and Heating)	**$112k** ($68k/yr to heat New Gym Complex)	**$84.7k** ($68k/yr to heat New Gym Complex)	**$51k** ($28k/yr to heat New Gym Complex)
Energy Costs Avoided	**Baseline**	**$900k over 20 years**	**$2M over 20 years**
Lifespan	**AC Chillers:** 15-20 Years **Boiler:** 15-25 Years	**Ground Source Loops:** 50+ years **WC Chillers:** 25-30+ Years	**Ground Source Loops:** 50+ years **Heat Pump:** 25 - 30 years

Borah HS Gym:
Cooling ✦ Heating Strategy Comparison

Boise Schools Sustainability
Environmental
Educational
Economic

Metric	Air-Cooled ✦ Boiler	Water-Cooled ✦ Boiler	Heat Pump Heater/Chiller
Noise	**Chiller Fan Noise** to Campus/Neighborhood 	**None** 	**None** 
Aesthetics	**Large Footprint** **Requires Enclosure**	**Visually Unobtrusive** **Housed inside Mechanical Room**	
Carbon Emissions (Over 20 yrs)	**12,000 MTCO2e** (203,000 tree seedlings grown for 10 years) (31.2M miles driven by an average gasoline car)	**11,000 MTCO2e** (179,000 tree seedlings grown for 10 years) (27.6M miles driven by an average gasoline car)	**3,000 MTCO2e** (47,000 tree seedlings grown for 10 years) (7.2M miles driven by an average gasoline car)
Contained Glycol Use	**Glycol Outside & Inside Buildings:** Outdoor Air-Cooled Chiller shares loop with indoor equipment	**Glycol Outside Only** Heat exchanger keeps indoor loop glycol-free.	
# of Systems to Maintain	**Two Outside**	**One Inside System**	
Other Considerations	**More exposure to weather** Greater wear and tear on equipment. **Limited future flexibility** Cooling only; heating upgrade would require major changes. **Higher refrigerant charge** for larger outdoor units.	**Future heating-ready** Higher avoided carbon emissions if expanded to heating, with reduced combustion risks. **Efficient land use** after temporary field disturbance.	**Balancing Heating and Cooling** Rejection to ground + higher avoided carbon emissions if expanded to heating, with reduced combustion risks. **Efficient land use** after temporary field disturbance

The land constraint: From 150 boreholes to 3



Bozeman, MT

GEOTHERMAL HEAT PUMP CASE STUDY:

Montana State University

25% Decrease in Energy Use Intensity



Name: Montana State University

Location: Bozeman, Montana

Site Type: University Campus

Size:

- 650,000 square feet (8 buildings) heated and cooled by geothermal systems
- 264 boreholes drilled 500–700 feet deep
- 100 boreholes and two new buildings planned for 2024–2025

Unique Features:

- 8,000 heating degree days per year
- Geothermal systems utilize 2.5 miles of existing utility tunnel system
- Includes fifth-generation ambient loop for energy sharing

Energy Savings:

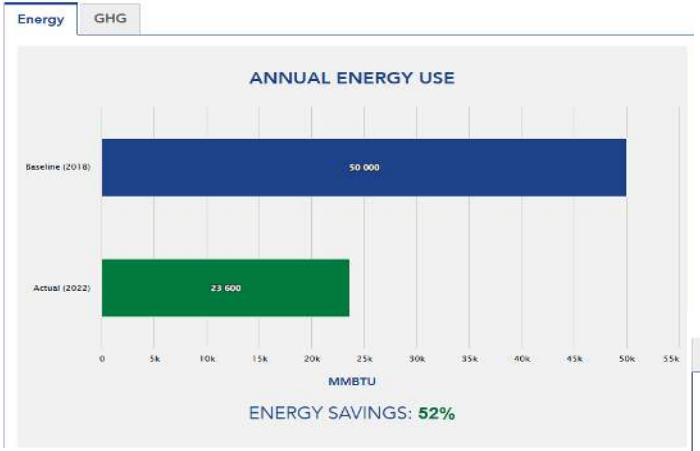
- Norm Asbjornson Hall, a campus engineering building, includes a geothermal heat pump system and operates at 35 kBtu/square feet/year, equating to 40% less carbon emissions than other comparable buildings on campus
- Campus building energy use intensity decreased by 25% from 2007 to 2023

Cost Savings:

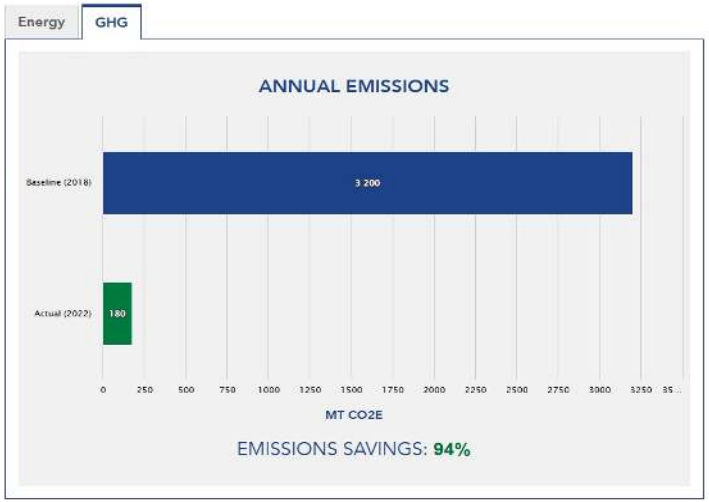
- The first campus energy district installed in 2011, including four buildings connected to a central heat pump plant and 52 geothermal boreholes, saves an average of $130,000 annually

Source: Energy.gov

Colorado State University



The bore field, located below a section of adjacent intramural sports fields, consists of 342 wells, 550-feet deep, and contains over 70-miles of closed-loop piping.



Source: Better Buildings Solutions

COLORADO STATE UNIVERSITY

SOLUTION TYPE
Showcase Project

SECTOR TYPE
Education

LOCATION
Fort Collins, Colorado

PROJECT SIZE
420,000 Square Feet

FINANCIAL OVERVIEW
$20 Million



CSU's Moby Athletic Complex

Create an umbrella - protect your goals



Prepare Owner's Project Requirements

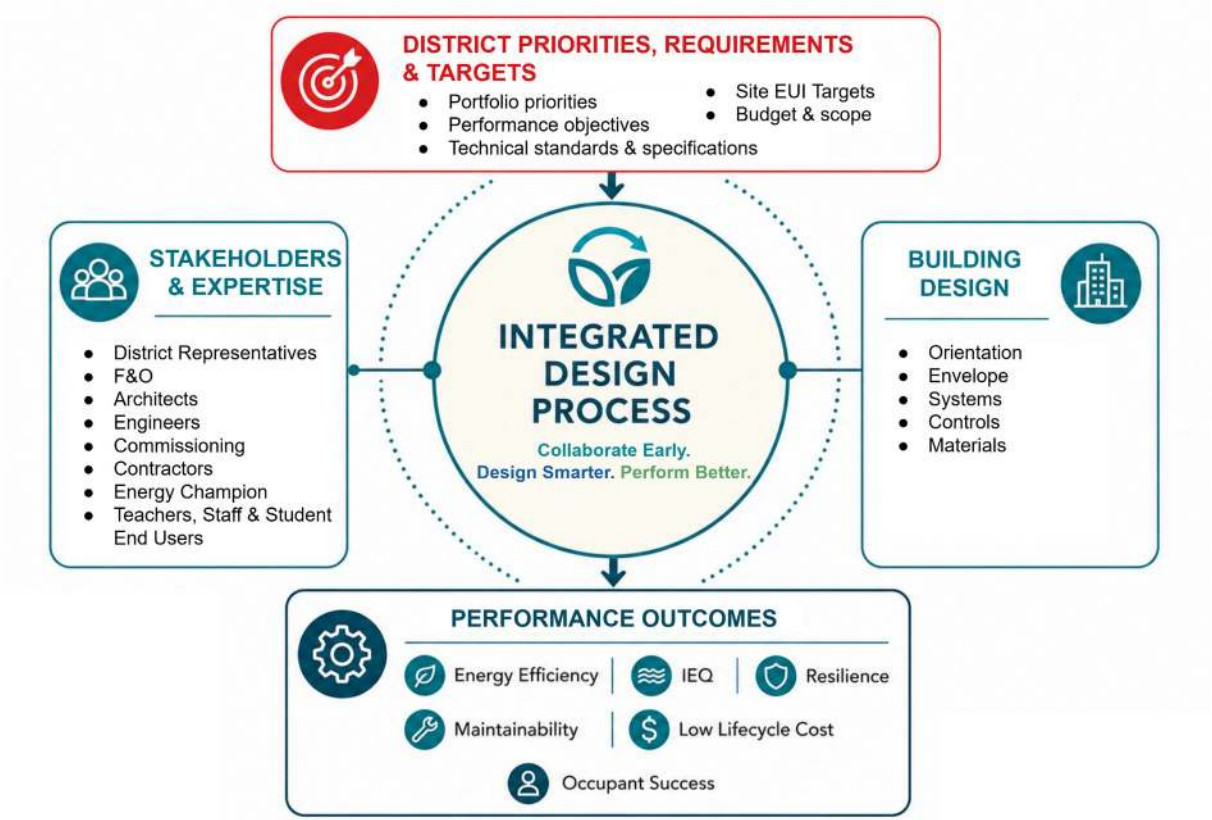
What are the Design Pain Points?

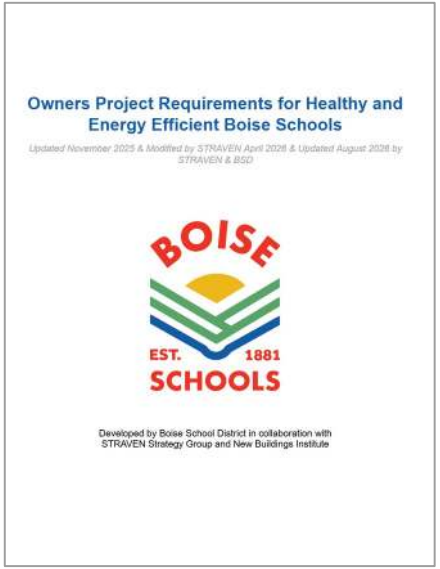


Figure 1. How District Needs Translate to Project Performance

BSD REQUIREMENTS	DESIGN TEAM RESPONSE	BSD REVIEW	VERIFY & LEARN
What BSD expects	*Design team proposal to meet expectations*	*BSD reviews for alignment*	*Did project perform as intended?*
OPR • District priorities • Portfolio targets • Performance expectations & requirements	**Basis of Design (BOD)** • Design approach • Applicable metrics • Assumptions • Project-specific performance objectives, as appropriate	**Design Review & Coordination** Evaluate & refine BOD and proposed design approach against OPR and other project requirements. Coordination meetings shall include, as applicable: • Energy Champion • Commissioning • Other Project Team Members • District • Design • Construction	**Lessons Learned Report** • Modeling • Commissioning • M&V Operational feedback supports continuous improvement
Technical Standards & Specifications • Technical criteria • Design requirements • Implementation requirements			

Prepare Owner's Project Requirements





Create a thriving community!



Intergovernmental Collaboration

Merge the civic infrastructure of schools, public libraries, and parks to create highly efficient “community hubs.”



By intentionally co-locating facilities and sharing resources, the city maximizes public tax dollars, avoids duplicating land purchases, and expands equitable access to neighborhoods.

Community Energy Ecosystem

Merge the civic infrastructure of schools, public libraries, and parks to create highly efficient “community hubs.”



Where should you invest?



Implement ✦ Learn

Turning concept into real-world data



ANALYZE
- Site conditions
- Loads and opportunities
- Define test plan

TEST
- Drill and evaluate a pilot (test) well
- Collect field data

PILOT
- Validate performance
- Refine design assumptions

MEASURE
- Monitor thermal performance
- Analyze flow and capacity

SCALE
- Confirm design
- Plan full implementation

Test Well Findings (Preliminary)

Stable Ground Temperature
~56–58°F at target depth

Strong Flow/Recharge
Sufficient for dipole configuration

Meets Design Assumptions
Supports planned system sizing

Advances to Pilot Design
Proceed to full system design and permitting

From Ambition to Implementation

Actionable Insights
Turns constraints into information that shapes implementable solutions.

Stronger Collaboration
Aligns leadership, operators, and the community around shared goals.

Greater Capacity
Develops staff expertise, systems, and processes to evaluate and deliver future projects.

Organizational Confidence
Builds the knowledge, experience, and trust to make good decisions.

Resilience
Better prepared for changing conditions, extreme weather, and future needs.

Long-Term Community Value
More efficient buildings, lower costs, and healthier, more resilient communities.



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THANK YOU!

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