



REPORT | SEPTEMBER 2026

Governance and Operations of Thermal Energy Networks

A guide for states, cities
and their partners

Worked examples:
Baltimore, New York City and Boston

GOAL

This report helps a state, a city or a partner make three choices for a thermal energy network (TEN). The choices are who owns it, how it sells service, and how it is paid for. The aim is a project that can get built and financed.

READ THIS FIRST

Key takeaways

01

Three decisions are linked

- Who owns the network
- How it sells service
- How it is paid for

02

State law is the gate

- 13 states have a heat network law
- 31 states: cities need express state permission

03

Split ownership broke the financing

- Troy, New York, 2025
- One owner now holds the whole network

04

Utility pilots stall on cost

- Maryland: stalled
- Lowell, Massachusetts: canceled

05

Cities are getting direct paths

- Vermont, 2024
- Colorado, 2026

06

One building is not a utility

- One building: a building system
- Many owners: a utility
- Heat is optional: sign-ups are the risk

07

Get the labels right

- Regulators judge substance, not contract names
- 63-20, 501(c)(3), conduit issuer: different tools

08

Plan without federal support

- 30% credit through 2032
- No credit written for heat networks
- DOE pilots: 5 selected, 3 left

13

states with a heat network law

31

states where cities need express state permission (2003 survey)

30%

federal geothermal heat pump credit

3

DOE district geothermal pilots left, of 5 selected

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How to read the sources: each fact carries a short source name and a number, for example (APPA 2026¹). The number links to the full source list at the end. Tags mark facts that are **UNCONFIRMED** or an **ESTIMATE**. Gaiergy opinion carries a **GAIERGY VIEW** tag or sits in a green box. All sources were accessed on 2026-09-30.

Acronyms

ACRONYM	MEANING
Aaa	Moody's highest bond rating
AC	Alternating current
APPA	American Public Power Association
ASC 842	Accounting Standards Codification Topic 842 (leases, private companies)
BDC	Baltimore Development Corporation
BGE	Baltimore Gas and Electric
c., ch.	Chapter (of session laws or general laws)
CFC	National Rural Utilities Cooperative Finance Corporation
CFR	Code of Federal Regulations
DASNY	Dormitory Authority of the State of New York
DB	Design-build
DBFOM	Design, build, finance, operate, maintain
DC	District of Columbia
DOE	United States Department of Energy
DPU	Massachusetts Department of Public Utilities
EaaS	Energy as a service
ESA	Energy service agreement (pay for measured savings)
ESCO	Energy service company
ESHB, 2SHB	Engrossed Substitute House Bill, Second Substitute House Bill (Washington)
ESPC ESA	Energy Savings Performance Contract Energy Sales Agreement (federal)
F	Degrees Fahrenheit
FEMP	Federal Energy Management Program (DOE)
GASB	Governmental Accounting Standards Board
GFOA	Government Finance Officers Association
G.L.	Massachusetts General Laws
GO	General obligation (bond backed by the issuer's taxing power)
GSEP	Gas System Enhancement Plan (Massachusetts)
H	House bill (Rhode Island)
HB	House Bill
HEET	Home Energy Efficiency Team (Massachusetts nonprofit)
ICMA	International Capital Market Association
IRC	Internal Revenue Code
IRS	Internal Revenue Service
LD	Legislative Document (Maine bill number)
LDC	Local development corporation (New York)
M	Million (dollars)
MassCEC	Massachusetts Clean Energy Center
MCEC	Maryland Clean Energy Center
MEDCO	Maryland Economic Development Corporation

ACRONYM	MEANING
MSRB	Municipal Securities Rulemaking Board
MW	Megawatt
NECPA	National Energy Conservation Policy Act (federal)
NRECA	National Rural Electric Cooperative Association
NYCEDC	New York City Economic Development Corporation
NYCHA	New York City Housing Authority
NYPA	New York Power Authority
NYSERDA	New York State Energy Research and Development Authority
OBBA	One Big Beautiful Bill Act (Public Law 119-21, 2025)
O&M	Operations and maintenance
P3	Public-private partnership
PAL	New York Public Authorities Law
P.A., P.L.	Public Act, Public Law
PIA	Project Implementation Agreement
PPA	Power purchase agreement
PSC	Public Service Commission (state utility regulator)
Pub. L.	Public Law (federal)
PUD	Public utility district (Washington)
Rev. Proc., Rev. Rul.	IRS Revenue Procedure, Revenue Ruling
RFEI	Request for expressions of interest
S	Senate bill (Rhode Island)
s.	Section (of a law or code)
SB	Senate Bill
SPV	Special purpose vehicle (a company set up for one project)
sq ft	Square feet
T.D.	Treasury Decision (IRS regulations)
TEN	Thermal energy network
TIF	Tax increment financing
TIFIA	Transportation Infrastructure Finance and Innovation Act (federal loans)
TPA	Thermal purchase agreement
TVA	Tennessee Valley Authority
USC	United States Code
USDA	United States Department of Agriculture
UTEN	Utility thermal energy network (New York pilots)
UTENJA	Utility Thermal Energy Network and Jobs Act (New York, 2022)
V.S.A.	Vermont Statutes Annotated
WARMTH	Name of the Maryland 2024 act on TEN pilots (HB 397 / SB 570)
WIFIA	Water Infrastructure Finance and Innovation Act (federal loans)

The three decisions

What this section shows: the three choices every TEN makes, and why they cannot be made one at a time. Applies to any state or city.

A TEN is a shared loop of water-filled pipe. The loop links wells or another heat source to heat pumps in many buildings. It crosses property lines and runs under public streets. That makes it look like a utility, even when it is small.

Every TEN answers three questions:

- 1. Who owns it.** A city, a county or regional authority, a state authority, a federal agency, a nonprofit or co-op, an investor-owned utility, a private developer, or a shared structure.
- 2. How service is sold.** By the unit of heat, by a flat fee for comfort, by measured savings, or under a federal energy sales contract.
- 3. How it is paid for.** City revenue bonds, a 63-20 or 501(c)(3) nonprofit corporation (defined in Section 6), a state conduit issuer, tax increment financing, a green bank, federal tax credits, or a mix.

Three decisions



Figure 1. The three decisions. Each choice limits the other two. Gaiergy graphic.

The links are concrete. Some examples:

- The federal geothermal heat pump credit goes to the owner of the ground loop and at least one connected heat pump (Treasury T.D. 10015²). So the ownership choice decides who can claim the credit.
- Tax-exempt bond financing can cut the credit by up to 15% (26 USC 45³; 26 USC 48⁴). So the financing choice changes the value of the credit.
- The New York PSC treats an entity that owns and operates a TEN “serving multiple customers across property lines” as generally a utility (NY PSC order, Case 22-M-0429⁵). So the owner and the sales contract together decide who regulates the network.
- A 63-20 bond deal ends with full legal title in government hands (Rev. Rul. 63-20; Rev. Proc. 82-26⁶). A 501(c)(3) owner financed with qualified 501(c)(3) bonds can keep the network (26 USC 145⁷). So the financing choice fixes the long-term owner.



Figure 2. One network, four layers: buildings with their heat pumps, the pipe network, the energy center and the well field. Each layer can have a different owner. The federal credit goes to the party that owns the ground loop and at least one connected heat pump (Treasury T.D. 10015²), so the way the layers are split decides who can claim it. Gaiergy illustration.

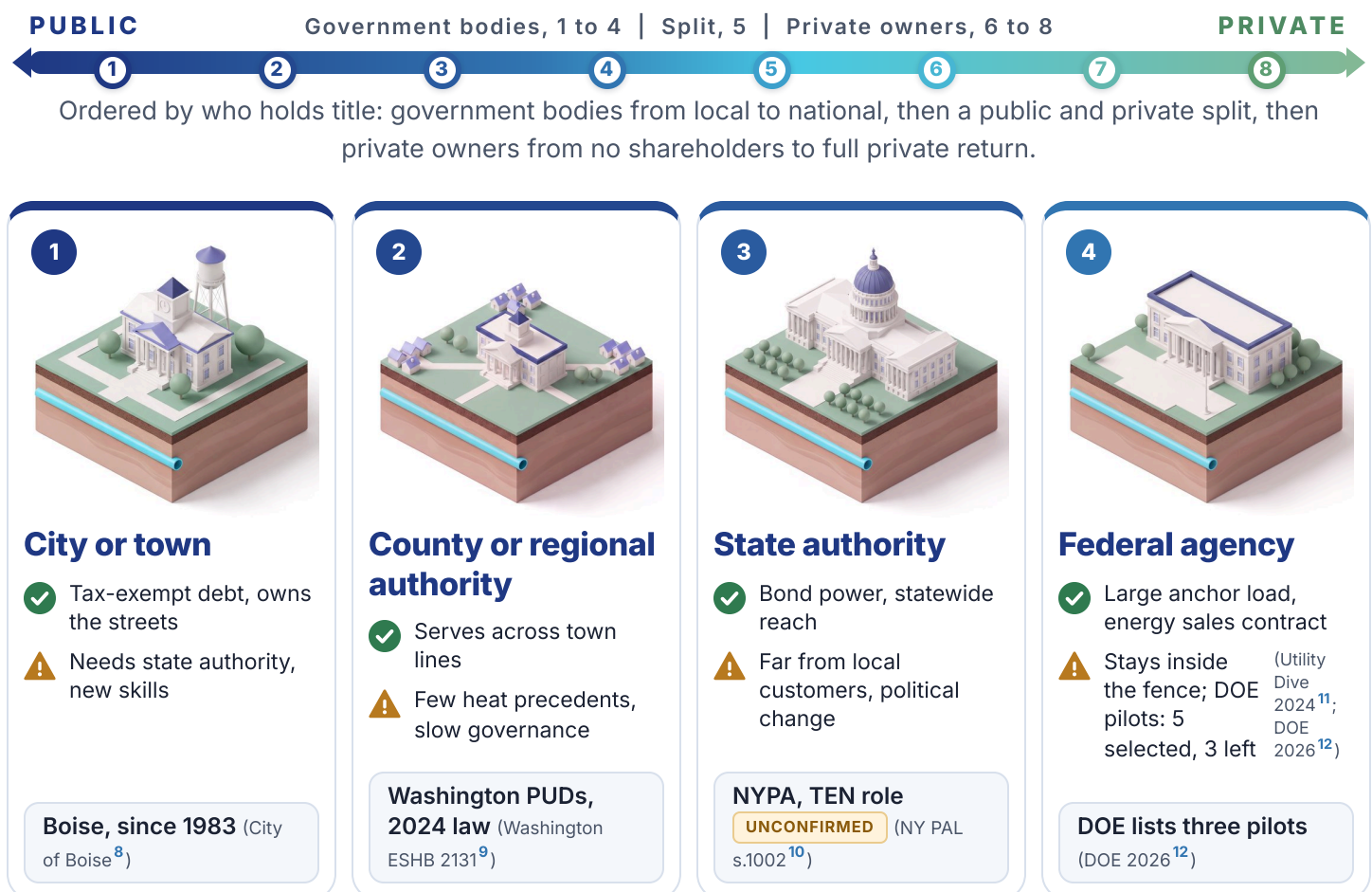
GAIERGY VIEW

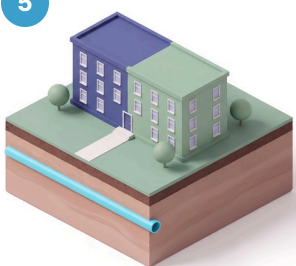
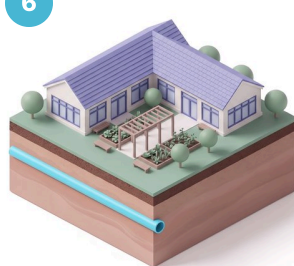
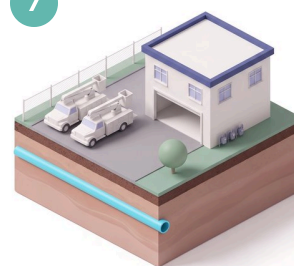
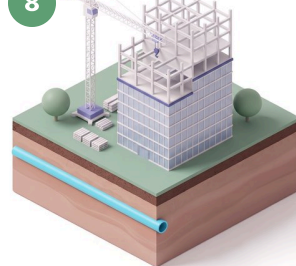
Teams often pick an owner first and leave finance to the end. Gaiergy recommends that a team test all three decisions together, early, against the state law that applies. A good owner with no path to finance does not get built.

SECTION 2

Who can own a network

What this section shows: the eight owner types, why each can work, and where each struggles. The strengths and weaknesses are Gaiergy's judgment. The examples are sourced.



5  Shared ownership ✓ Public land or debt plus private skill ⚠ Split title can block financing Troy, NY: dropped 2025 (National Grid, Troy Stage 2, 2025¹³)	6  Nonprofit or co-op ✓ Mission first, no shareholder return ⚠ No rate or eminent domain power District Energy St. Paul (District Energy St. Paul¹⁴)	7  Investor-owned utility ✓ Operating skill, most TEN laws use it ⚠ Cost, regulator approval Eversource, Framingham, MA (Eversource¹⁵)	8  Private developer ✓ Speed, bundles with real estate ⚠ Costlier capital, may be regulated Whisper Valley, Austin (EcoSmart¹⁶)
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✓ Why it can work ⚠ Where it struggles. Strengths and struggles: **GAIERGY VIEW** Examples: sourced.

The facts behind the cards

- **City or town.** There are 1,998 public power utilities in the United States that serve over 55 million people (APPA 2026¹). Boise, Idaho has run a city geothermal heating system since 1983 (City of Boise⁸). A city needs legal authority first (Section 3). **GAIERGY VIEW** Most city public works staff have not run wells, heat pumps or customer billing for heat, and a network competes with schools, water and roads for the city's borrowing capacity.
- **County or regional authority.** In Washington, public utility districts (PUDs) “may own, operate, or manage a TEN” under a 2024 law (Washington ESHB 2131⁹).
- **State authority.** The New York Power Authority (NYPA) is “a corporate municipal instrumentality of the state” under New York Public Authorities Law (PAL) s.1002 (NY PAL s.1002¹⁰). Whether NYPA may own TENs is **UNCONFIRMED**.
- **Federal agency.** A federal site can buy energy from a private owner under an Energy Savings Performance Contract Energy Sales Agreement (ESPC ESA). The Federal Energy Management Program (FEMP) describes it for on-site electricity (DOE FEMP¹⁷). Its use for heat is **GAIERGY VIEW**. DOE selected five district pilots in December 2024 (Utility Dive 2024¹¹). The DOE page now lists three (DOE 2026¹²).
- **Nonprofit or co-op.** District Energy St. Paul is a nonprofit and runs the largest hot water district system in North America (District Energy St. Paul¹⁴). NRECA has 890 member utilities that serve about 42 million people (NRECA 2026¹⁸). A 501(c)(3) owner can finance a network with tax-exempt qualified 501(c)(3) bonds and keep it (Section 6) (26 USC 145⁷). A member co-op under 26 USC 501(c)(12) is another nonprofit path, and the IRS counts co-ops that provide “water and sewer services” as like organizations (IRS Publication 557¹⁹). **GAIERGY VIEW** A thermal water network can be organized the same way, like a mutual water company (Section 6).

- **Investor-owned utility.** Most TEN laws work through gas or electric utilities (Section 3). New York directs its seven largest utilities to propose *“at least one and as many as five”* pilots (NY S9422 text²⁰). Eversource runs a working network in Framingham, Massachusetts: about one mile of main pipe, 90 boreholes, 36 buildings and 135 customer accounts (Eversource¹⁵). It launched in 2024 (Canary Media 2025²¹). The struggle is cost: the Maryland PSC did not approve utility pilots in December 2025 and cited cost (Maryland Matters 2026²²), and National Grid canceled its Lowell pilot in December 2024 because *“the cost per customer for this project was unfortunately much too high”* (WBUR 2025²³).
- **Private developer.** At Whisper Valley in Austin, Texas, EcoSmart designed, installed, owns and operates four district geothermal systems that serve over 800 single-family homes. Homeowners pay EcoSmart *“an operations fee for continued access to the geothermal system”* (EcoSmart¹⁶). The fee amount is **UNCONFIRMED**. Vicinity Energy runs district energy systems in 12 US cities (Vicinity Energy²⁴). A private owner that serves many customers across property lines may be regulated as a utility (NY PSC order, Case 22-M-0429⁵).

Shared ownership

In a shared model, a public body owns one layer (often the wells, Figure 2) and a utility or private firm owns the rest. Troy, New York tested this. The plan put the well field with the Troy Local Development Corporation (LDC), which would charge National Grid a fee. It was dropped in August 2025 (National Grid, Troy Stage 2, 2025¹³). The filing gives these reasons (National Grid, Troy Stage 2, 2025¹³):

- The LDC has no taxing powers or other revenue, so financing was *“significantly limited, if not altogether, unavailable.”*
- The LDC would have had to *“contract out all operations and maintenance to a third-party firm.”*
- With the whole network under one owner, the project satisfies *“one important criterion”* for the federal credit. Under split ownership, credit eligibility was less likely.

National Grid will now build, own and operate the well field. The LDC leases park land from the City and subleases it. The project serves 6 historic buildings and about 100 customers with 200 boreholes, at a forecast total of \$90.91M (National Grid, Troy Stage 2, 2025¹³).

Troy, New York: split ownership vs one owner

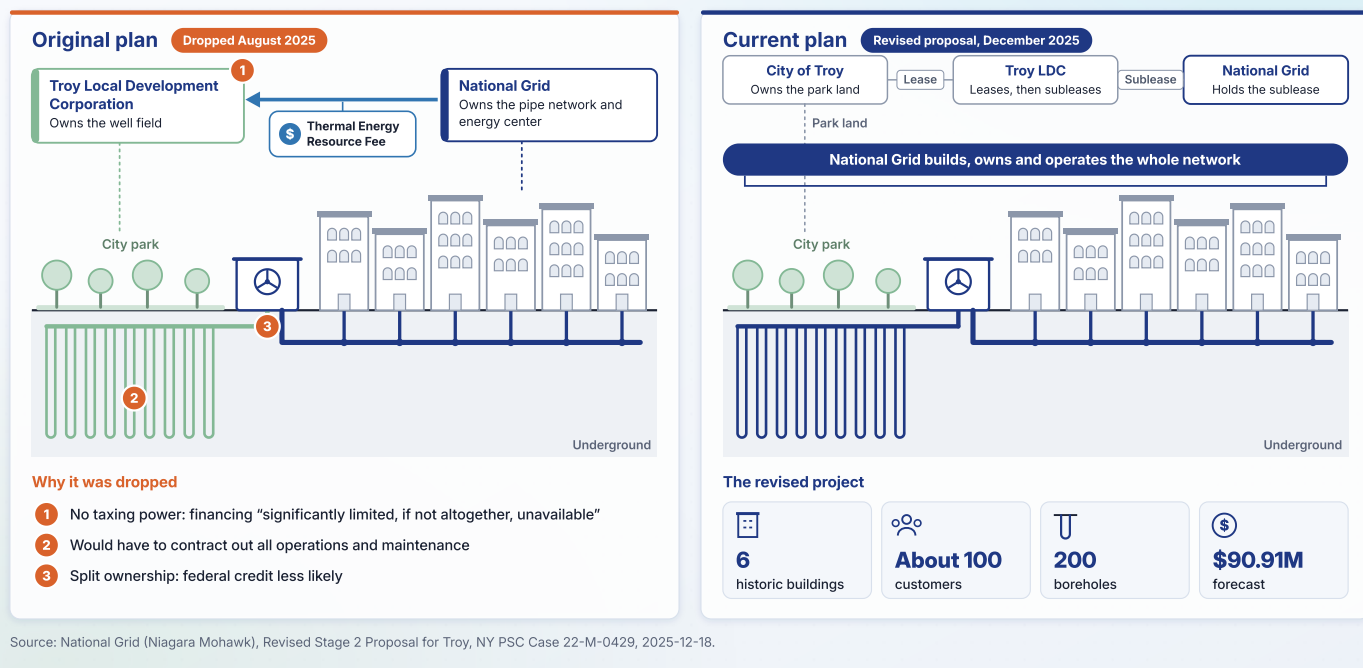


Figure 3. Troy, New York. Left: the original split plan, dropped in August 2025. Right: the revised plan, with one owner for the whole network. Gaiergy graphic based on (National Grid, Troy Stage 2, 2025¹³)

SECTION 3

State law is the gate

What this section shows: how much power a city has on its own, which states have a TEN law, and what each law allows. Status as of September 2026.

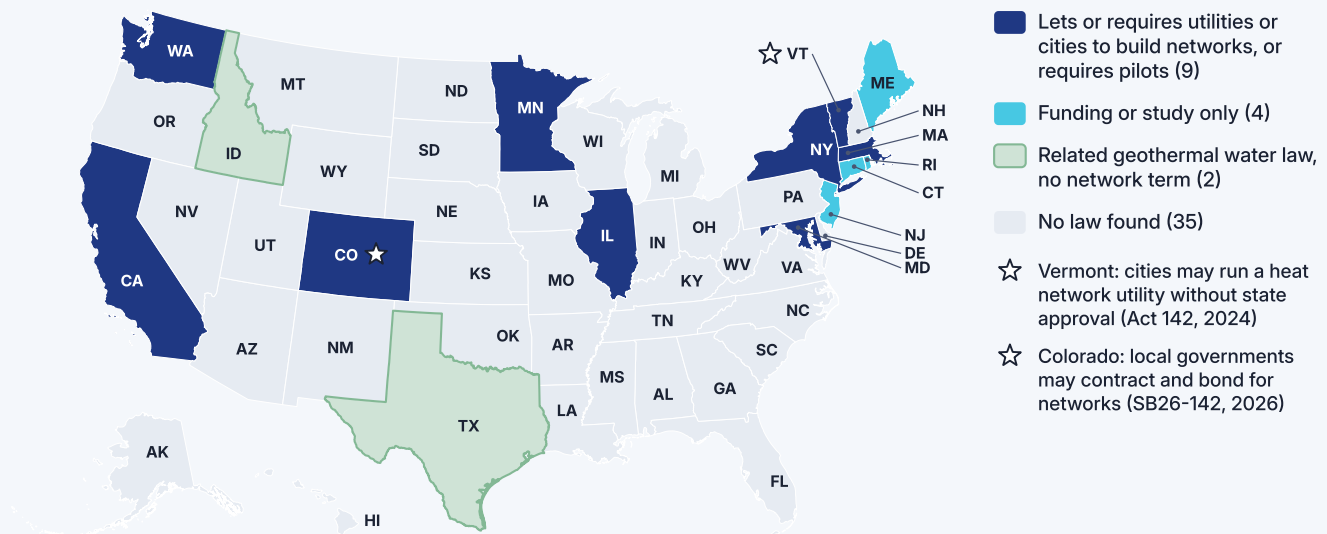
Dillon's Rule and home rule

Under Dillon's Rule, a city has only the powers the state gives it in express terms. Under home rule, a city has broad powers unless the state takes them away. A 2003 Brookings survey classed 31 states as Dillon's Rule for all cities, 8 for some local governments, and 10 as not following it; Florida was unclear (Brookings 2003²⁵).

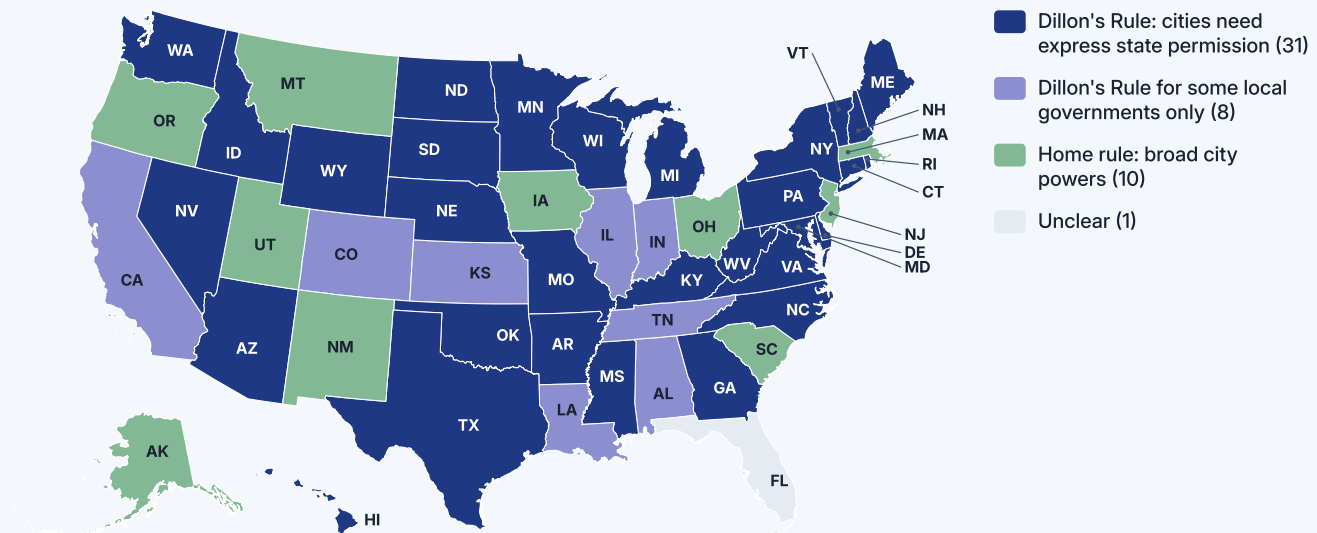
The labels are not exact. For example, the survey marks New York "Yes," but notes that the New York Constitution rejects strict construction for powers granted under its Article IX (Brookings 2003²⁵).

This matters for a TEN because heat networks are new. In a Dillon's Rule state, a city that wants to own a network will look for a statute that names it. GAIERGY VIEW Most state codes do not.

Which states have a heat network law (Sept 2026)



How much power do cities have? (Dillon's Rule, 2003 survey)



Heat network laws: Gaiergy count from state legislature records and the Building Decarbonization Coalition tracker (which lists 14 states, including Texas), accessed 2026-09-30.

Dillon's Rule: Richardson, Gough and Puentes, Is Home Rule the Answer?, Brookings Institution, 2003, Appendix A.

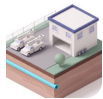
Figure 4. Top: 13 states have a law that deals with TENs by Gaiergy's count (the tracker lists 14, including Texas); Vermont and Colorado give local governments a direct path. Bottom: most states limit city powers under Dillon's Rule. Grouping is Gaiergy's. Sources: (Building Decarbonization Coalition 2026²⁶; Brookings 2003²⁵)

TEN laws by state

By Gaiergy's count from the Building Decarbonization Coalition tracker, 13 states have enacted laws that deal with TENs in express terms. The tracker lists 14, because it also includes Texas (Building Decarbonization

Coalition 2026²⁶). **GAIERGY VIEW** Gaiergy groups them as 9 laws that let or direct utilities or cities to build TENs, and 4 that fund, study or make pilots optional. Texas and Idaho have related geothermal water laws that do not use the TEN term (Building Decarbonization Coalition 2026²⁶; Idaho HB 676 (2026)²⁷).

BUILD OR PILOT LAWS 9 states

 Massachusetts Acts 2021 ch. 8; 2022 ch. 179; 2024 ch. 239 (Mass. Acts 2021 ch. 8²⁸; Mass. Acts 2022 ch. 179²⁹; Mass. Acts 2024 ch. 239³⁰) - DPU may approve gas company thermal pilots - GSEP may fund thermal - A gas company may sell networked geothermal WHO MAY OWN  Gas companies City path not found UNCONFIRMED	 New York UTENJA, Laws 2022 ch. 375 (NY UTENJA 2022³¹; NY S9422 text²⁰) 7 largest utilities propose 1 to 5 pilots - PSC regulates WHO MAY OWN  Utilities PSC declined a blanket city exemption (NY PSC order, Case 22-M-0429⁵)	 Colorado ☆ CITY PATH HB22-1381; HB23-1252; HB24-1370; SB26-142 (Colorado HB22-1381³²; Colorado HB23-1252³³; Colorado HB24-1370³⁴; Colorado SB26-142³⁵) - Geothermal grants; gas utility pilots (over 500,000 customers); gas planning pilot communities - Local governments may contract for and bond-finance TENs WHO MAY OWN  Utilities  Local governments
 Minnesota Minn. Stat. 216B.2427 (Minn. Stat. 216B.2427³⁶) - Utilities with over 800,000 customers - At least 15% of innovation plan costs on TEN projects WHO MAY OWN  Gas utilities	 Maryland WARMTH Act, HB 397, 2024 ch. 564 (Maryland ch. 564 (2024)³⁷; Maryland SB 570 fiscal note³⁸) - Gas companies with 75,000+ customers file 1 to 2 pilots 80%+ low or moderate income; cities, counties, community groups may nominate neighborhoods WHO MAY OWN  Electric, gas or water companies No city ownership path	 Vermont ☆ CITY PATH Act 142 of 2024 (Vermont Act 142³⁹) - Town may build, run, set rates, finance, use eminent domain - No Public Utility Commission approval WHO MAY OWN  Municipalities



Washington

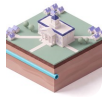
ESHB 2131 (2024); 2SHB 1514, Laws 2025 ch. 263 (Washington ESHB 2131⁹; Washington 2SHB 1514⁴⁰)

- Utility TENS
- A regulated class of private “thermal energy companies”

WHO MAY OWN



Gas and electric companies



PUDs



Thermal energy companies

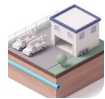


California

SB 1221, 2024 ch. 602 (California SB 1221⁴¹)

- Up to 30 gas decommissioning pilots
- Names neighborhood electrification and TENS as alternatives

WHO MAY OWN



Gas corporations



Illinois

SB 25, P.A. 104-0458 (2026) (Illinois P.A. 104-0458⁴²)

- TEN pilots
- Up to \$20M if federal funding is not available or not enough

WHO MAY OWN



Utilities

 Rhode Island H 7879 Sub A / S 3080 (2026) (Rhode Island H 7879 Sub A ⁴³; Building Decarbonization Coalition 2026²⁶) - Utilities with over 25,000 ratepayers: 2 to 12 sites, at least 2 feasibility studies - Pilot proposal optional WHO MAY OWN  Utilities, if they propose Enactment: UNCONFIRMED in a primary source (FastDemocracy, RI HB 7879 ⁴⁴)	 Connecticut P.A. 25-173 s.32 (Connecticut P.A. 25-173 ⁴⁵; Building Decarbonization Coalition 2026²⁶) - Grant and loan program "within available appropriations" - Tracker: no funding in 2025 WHO MAY OWN  Funding only	 New Jersey P.L.2023 c.328 (New Jersey P.L.2023 c.328 ⁴⁶) Board of Public Utilities study of large-scale geothermal heat pump systems WHO MAY OWN  Study only	 Maine LD 1619 (2025) (Building Decarbonization Coalition 2026²⁶) 13-member commission to study a TEN program - Final report due 2025-12-03 WHO MAY OWN  Study only
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City path: a local government may own or contract directly



Utility



City or town



Regional authority



Private company

Grouping:

GAIERGY VIEW

What the types of law allow

- Utility pilot laws** (New York, Maryland, Massachusetts, Minnesota, California, Illinois) put the utility in charge. **GAIERGY VIEW** A city is mostly a host, a customer or a land partner. Maryland lets a city nominate neighborhoods (Maryland ch. 564 (2024) ³⁷).
- City pathway laws** (Vermont, Colorado) let a local government own or contract for a network directly (Vermont Act 142 ³⁹; Colorado SB26-142 ³⁵).
- Market laws** (Washington 2025) create a regulated class of private thermal energy companies (Washington 2SHB 1514 ⁴⁰).
- Funding, study and optional pilot laws** (Rhode Island, Connecticut, New Jersey, Maine) fund, study or permit pilots, but do not settle ownership.

New York declined a municipal exemption

The New York PSC adopted initial TEN rules on 2024-07-18. It "declines to categorically exempt municipal-owned TENs from regulation at this time," although New York City asked for an exemption (NY PSC order, Case

22-M-0429⁵). So a city-owned network in New York that serves several customers may still face PSC review.

GAIERGY VIEW A Gaiergy search of the docket found no Stage 3 construction order as of 2026-09-30.

Vermont and Colorado give cities a direct path

Vermont Act 142 lets a municipality “construct, operate, set rates for, finance, and use eminent domain for” a TEN utility with no certificate of public good or Public Utility Commission approval (Vermont Act 142³⁹).

Colorado SB26-142 lets local governments contract for TEN service and bond-finance TEN infrastructure. Its signed act is dated 2026-06-02 (Colorado SB26-142³⁵).

Boise: the long-running city precedent

Idaho city law counts “a public water system providing water at any temperature for space heating or cooling” as a water system. It appears in the water system definition (s.50-323, amended 1979) and in the city bond statutes (s.50-1020 and s.50-1029) (Idaho Code 50-323⁴⁷; Idaho Code 50-1020⁴⁸; Idaho Code 50-1029⁴⁹).

Boise's system started with 15 buildings in 1983. Today it heats about 90 buildings and over 6 million square feet with 177 F water (City of Boise⁸).

A 2026 Idaho law (HB 676) is a statewide water-rights change. It makes low-temperature municipal geothermal heating a “municipal purpose” if the water is reinjected. It does not name Boise (Idaho HB 676 (2026)²⁷).

Lesson. Boise worked because the state named the use in the city's utility and bond law.

GAIERGY VIEW Gaiergy recommends that a city in a Dillon's Rule state look for that kind of express grant before it plans to own a network.

SECTION 4

Lessons from power, water and district energy

What this section shows: what older public and private utilities teach about TEN ownership. Facts are sourced; the lessons are Gaiergy's view.

Public power and co-ops are proven

The United States has 1,998 public power utilities that serve over 55 million people (APPA 2026¹). NRECA has 890 member utilities that serve about 42 million people (NRECA 2026¹⁸). Public and member ownership of a utility is normal. **GAIERGY VIEW** The open question for heat is not “can a public body own a utility” but “does this public body have the authority, the skills and the customers.”

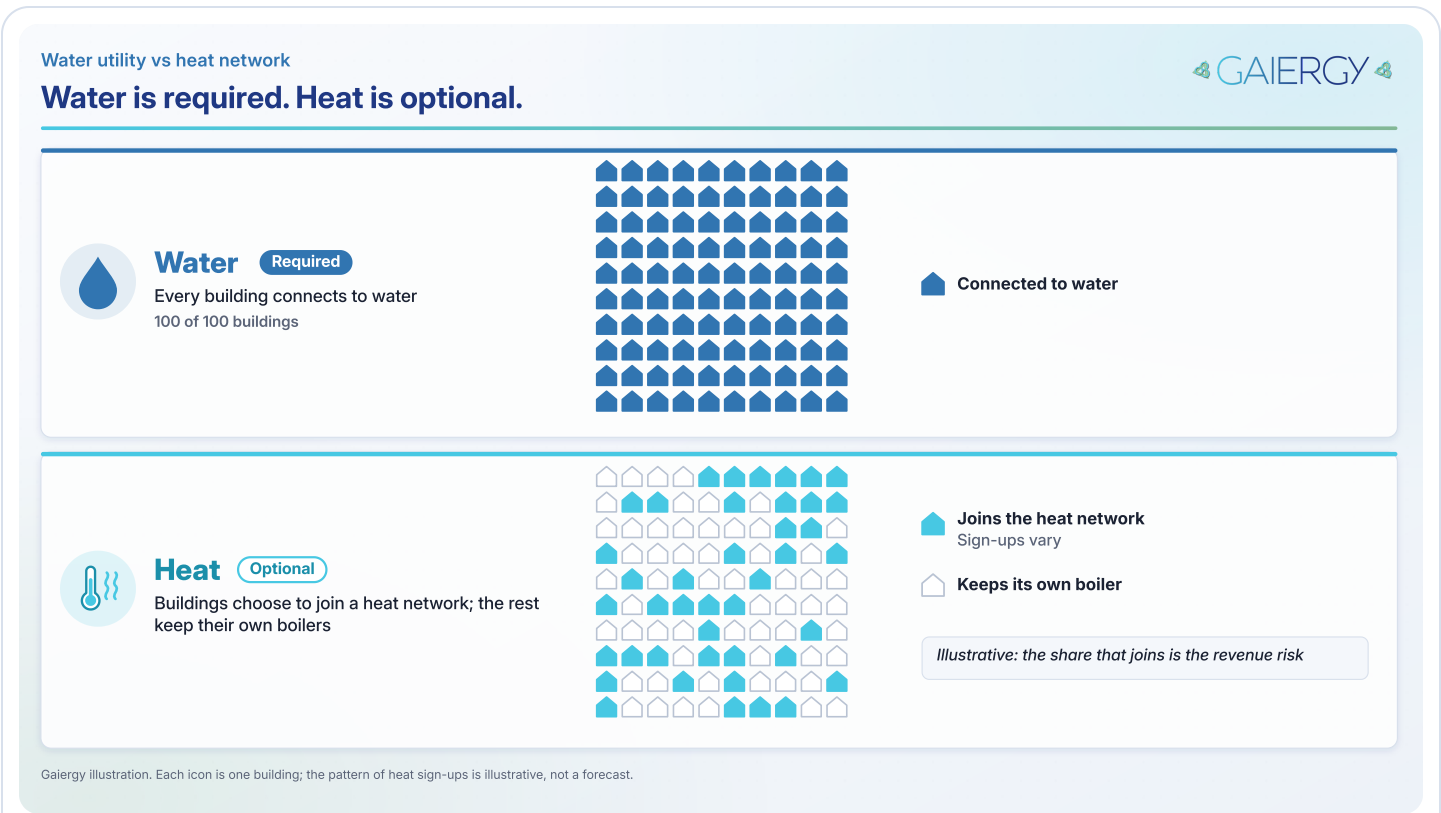
Buying an existing system is hard

After 10 years of effort to form a city electric utility, Boulder, Colorado voters approved ballot measure 2C in November 2020 and returned to an Xcel franchise (Boulder Beat 2020⁵⁰; City of Boulder⁵¹). In Maine, Question 3 on 2023-11-07 proposed a new consumer-owned Pine Tree Power Company (Maine Office of the Public Advocate⁵²). It got about 30.3% yes and 69.7% no (122,961 to 283,401) (Maine Secretary of State⁵³).

GAIERGY VIEW Both efforts tried to take over a system that already existed. A TEN is usually new. Public ownership is easier to set up at the start than to buy later.

Water works because every building connects

GAIERGY VIEW A city water system has a secure revenue base. Every building needs water, and codes make buildings connect. Heat is different. A building owner can keep a boiler, a furnace or a rooftop unit. So a TEN wins its customers one at a time. That risk shows up in bond ratings, reserves and interest rates.



utilities, in one trench, before the road is paved. Cost and risk are lower.

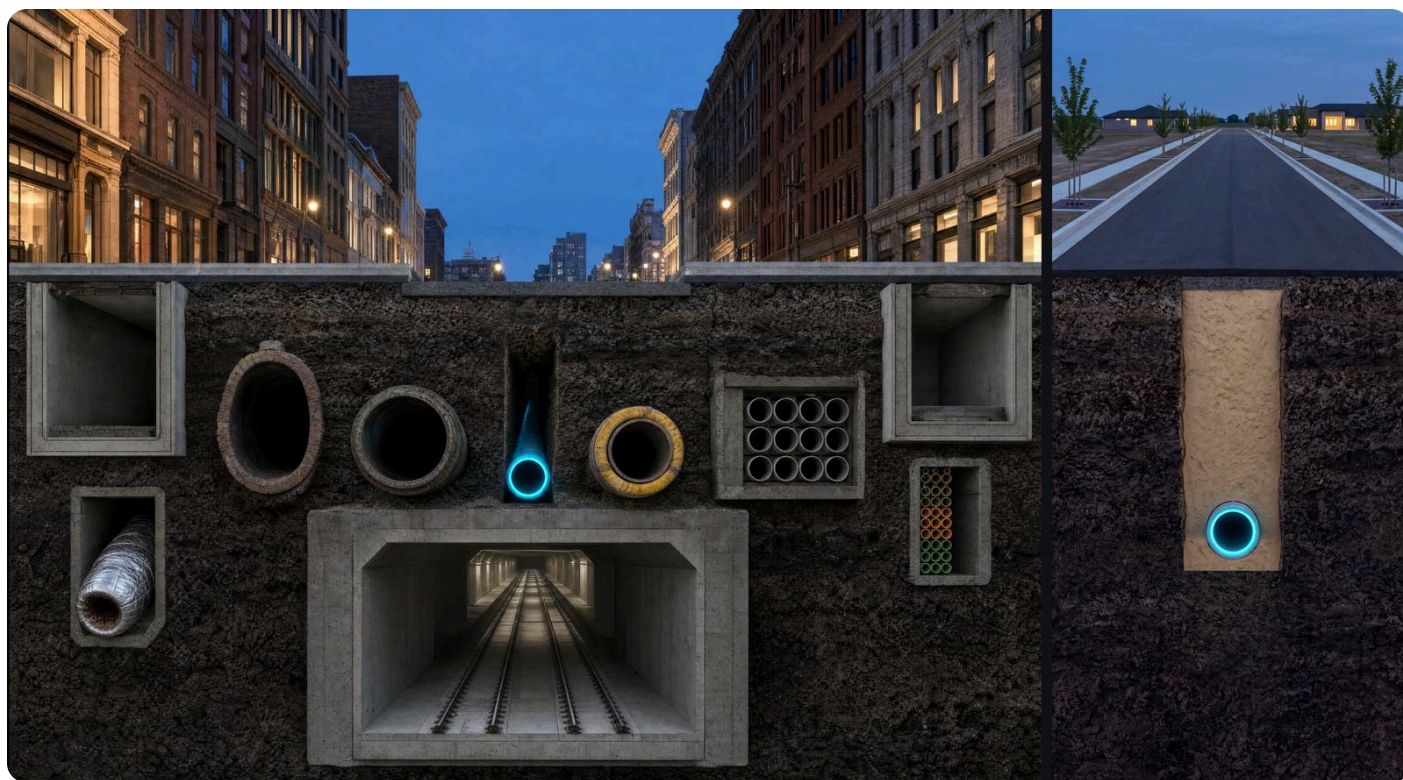


Figure 6. Left: under an old downtown street, pipes, ducts and a subway box already fill the ground, and the new main (cyan) squeezes into a narrow gap. Right: under a new street, the main goes into one clean trench. Gaiergy illustration.

District energy: mostly private, with one large nonprofit

- Con Edison runs the largest district energy steam system in the United States (Con Edison⁵⁴), with approximately 105 miles of steam pipe across their service territory and more than 1,500 buildings (Con Edison 2022⁵⁵; Con Edison⁵⁴).
- Vicinity Energy runs district energy systems in 12 US cities, including Baltimore, Boston, Cambridge, Philadelphia and Washington, DC (Vicinity Energy²⁴).
- CenTrio, “formerly known as Enwave Energy US,” was acquired by QIC and Ullico in 2021 (IDEA 2021⁵⁶).
- District Energy St. Paul is a nonprofit and runs the largest hot water district system in North America (District Energy St. Paul¹⁴).

GAIERGY VIEW Most large US district energy systems in this list are private. District energy shows that public and private owners can both run shared heat for a long time. An existing district energy owner is also a natural partner, or competitor, for a new TEN in the same downtown.

How service is sold

What this section shows: four contract types for selling heat, who carries each risk, how each can affect a customer's balance sheet, and which is more likely to bring in a utility regulator.

Four contract types

The first three definitions below are Gaiergy working definitions of common market terms. The federal definition is from FEMP.

- **Power purchase agreement (PPA) or thermal purchase agreement (TPA).** The customer buys metered units of energy at a set price per unit. The seller owns and runs the equipment. WORKING DEFINITION
- **Energy as a service (EaaS).** The customer pays a flat or fixed fee for an outcome, such as a heated and cooled building. The provider owns and runs the system. WORKING DEFINITION
- **Energy service agreement (ESA).** The customer pays for measured savings against a baseline. The provider is paid less if savings are lower. WORKING DEFINITION
- **Federal ESPC ESA.** An energy savings performance contract under the National Energy Conservation Policy Act (NECPA). The statute says: “Each such contract may, notwithstanding any other provision of law, be for a period not to exceed 25 years.” (42 USC 8287⁵⁷) FEMP describes the energy sales agreement form for on-site electricity: the energy service company (ESCO) owns the system and the agency buys the electricity it produces (DOE FEMP¹⁷). GAIERGY VIEW The same structure could be used for heat.

Who carries which risk

The key difference is what happens when heat use changes. GAIERGY VIEW

- **Per-unit sale (PPA or TPA).** If use goes up, the customer pays more. If use goes down, the provider loses revenue, unless a take-or-pay clause moves that risk to the customer.
- **Flat-fee EaaS.** If use goes up, the provider pays for the extra heat. If use goes down, the customer still owes the fee.
- **ESA.** Both sides share the change, because payment follows measured savings.
- **Production and performance.** The provider carries production risk in all four types. Performance risk (is the building comfortable?) sits with the customer under a per-unit sale, and with the provider under EaaS or an ESA.

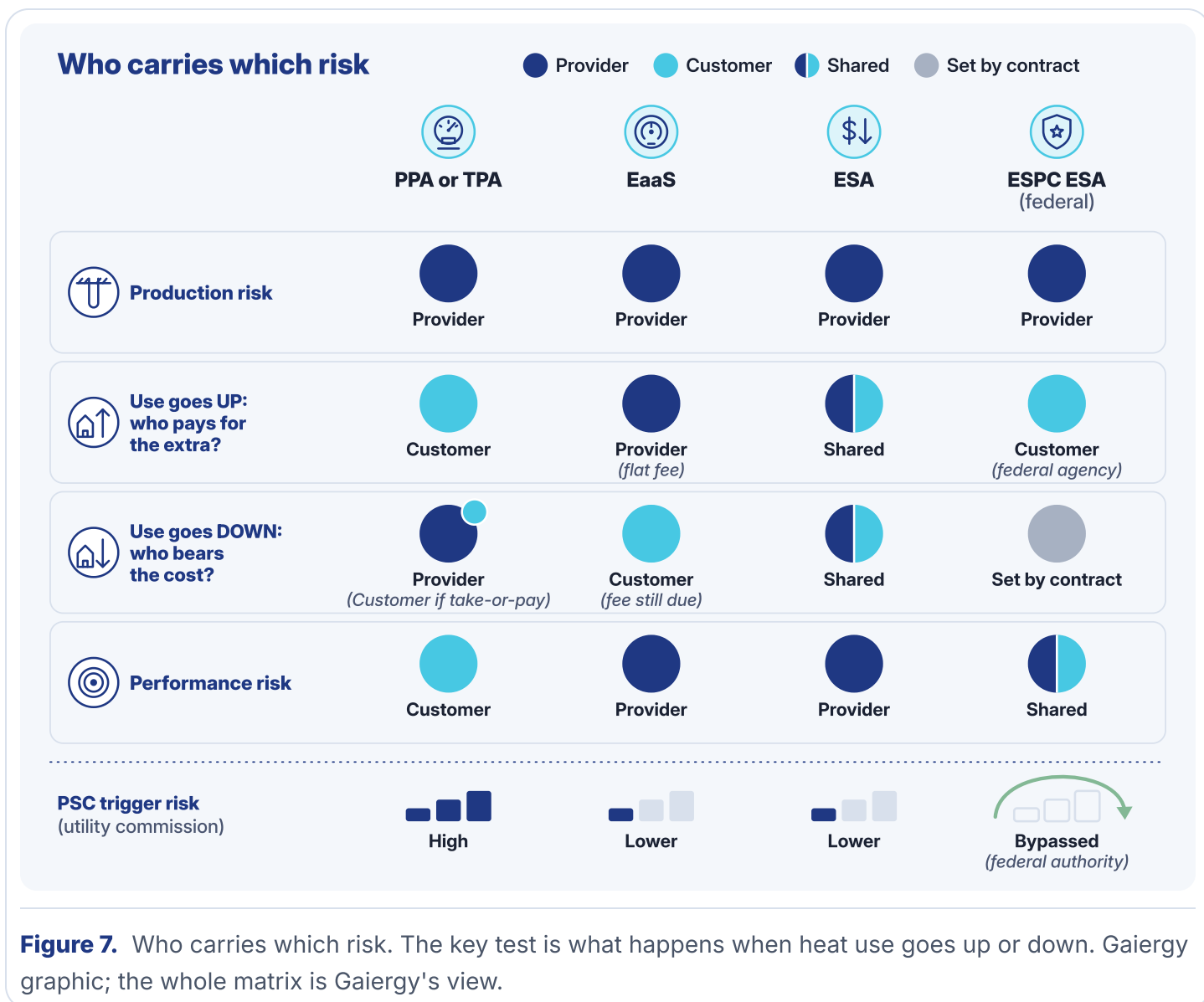


Figure 7. Who carries which risk. The key test is what happens when heat use goes up or down. Gaiergy graphic; the whole matrix is Gaiergy's view.

Balance sheet: when can a contract become a lease?

Private companies follow the lease rule ASC 842. Under it, a contract holds a lease if the customer controls the use of an identified asset. Control means the customer gets substantially all the economic benefits and also has the right to direct how the asset is used. Buying all the output is not enough on its own. A PPA can become a lease when the buyer holds dispatch rights (Deloitte Roadmap: Leasing⁵⁸).

Cities, public hospitals and public universities follow GASB Statement 87 instead. It defines a lease as a contract that “conveys control of the right to use another entity's nonfinancial asset” (GASB 87 summary⁵⁹).

GAIERGY VIEW In plain terms: a customer that only buys heat usually keeps the contract off its balance sheet. A customer that also decides how and when the equipment runs may book a lease.

Regulation: the label does not decide it

The New York PSC says an entity that owns and operates a TEN serving multiple customers across property lines “*would generally be considered a utility*” (NY PSC order, Case 22-M-0429⁵). The test looks at what the network does, not what the contract is called.

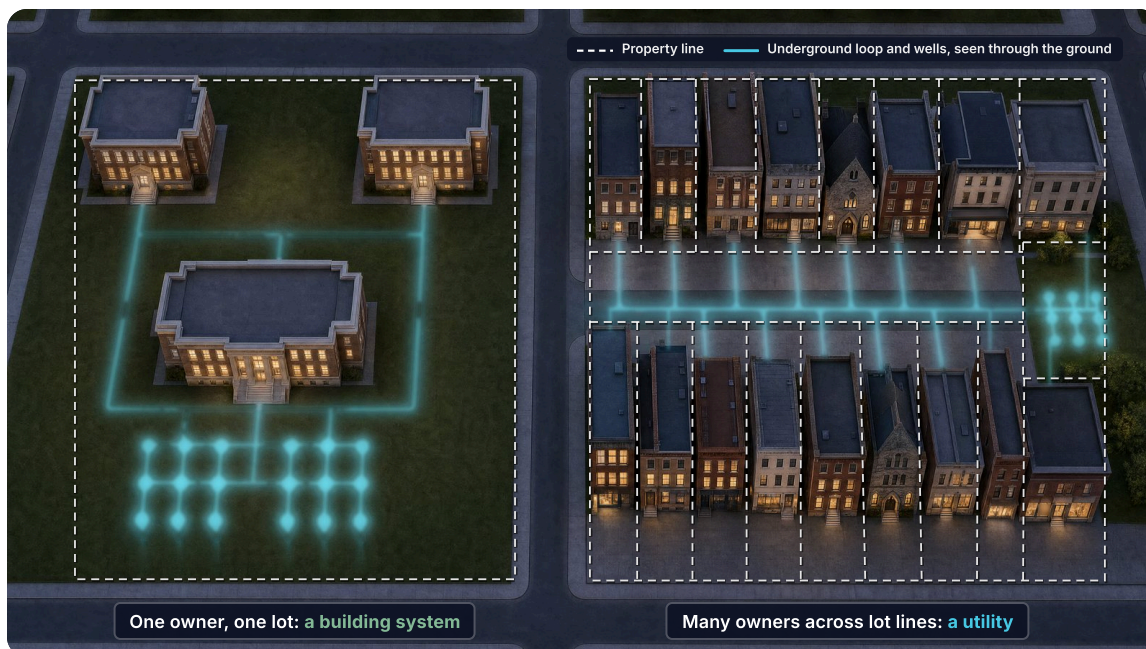


Figure 8. Left: one owner with its own wells and loop inside one lot is a building system. Right: one loop that crosses lot lines to serve buildings with many owners would generally be a utility under the New York PSC test (NY PSC order, Case 22-M-0429⁵). Gaiergy illustration.

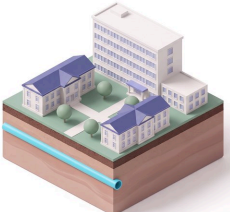
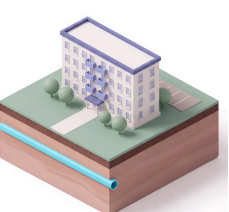
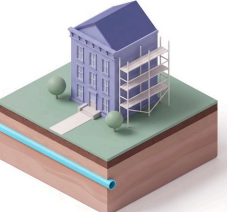
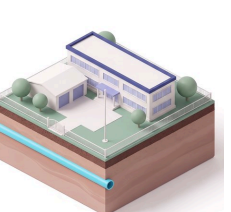
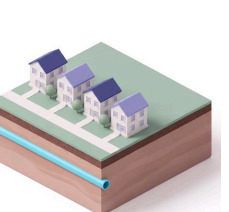
GAIERGY VIEW

A per-unit sale of heat to many customers looks most like a utility. A flat-fee service contract may look less like one. But a regulator can look past the name to the economic substance. Gaiergy recommends that a developer ask the state regulator early, in writing, how it will treat the chosen structure.

Layered contracts

GAIERGY VIEW One network can use several contracts at once, one at each handoff between the layers in Figure 2 (Section 1). For example: the well field owner sells heat to the pipe network owner under a TPA. The network owner then serves buildings under a tariff, a flat fee or a per-unit price. The contract at each handoff sets who carries the risk there.

Which contract fits which customer

 Hospital, university, government campus CONTRACT THAT OFTEN FITS PPA or TPA with take-or-pay Steady load, strong credit: revenue certainty for lenders	 Apartment buildings, small owners CONTRACT THAT OFTEN FITS EaaS or flat monthly fee Predictable bill, no technical role	 Existing building retrofit CONTRACT THAT OFTEN FITS ESA Pays on measured savings: low adoption risk	 Federal facility CONTRACT THAT OFTEN FITS FEMP ESPC ESA Federal contract authority; up to 25 years under 42 U.S.C. § 8287 (42 USC 8287⁵⁷)	 Customers of a regulated utility CONTRACT THAT OFTEN FITS Tariff approved by the PSC Utility sets rates through the regulator (NY UTENJA 2022³¹)
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Fit and reason: **GAIERGY VIEW** except where a source is shown.

SECTION 6

How it is paid for

What this section shows: the main ways to finance a TEN, the choice between a general obligation (GO) bond and a revenue bond, what a climate (green) bond label adds, what each financing tool is in law, how a 63-20 corporation differs from a 501(c)(3) corporation, how a tax-exempt P3 fits the pieces together, and how federal tax credits work after the 2025 tax law. Rates are July 2026 estimates.

GO bonds or revenue bonds: who pays it back

A city that borrows for a TEN has two main choices: a general obligation (GO) bond or a revenue bond (SEC Investor.gov⁶⁰). A GO bond is backed by the issuer's *"full faith, credit and taxing power"*. A revenue bond is *"payable from a specific source of revenue"*, and the issuer does not pledge its taxing power (MSRB, Sources of Repayment⁶¹). In plain terms: every taxpayer in the city stands behind a GO bond. Only the network's customers repay a revenue bond (Figure 9).

GO bond or revenue bond: who pays it back

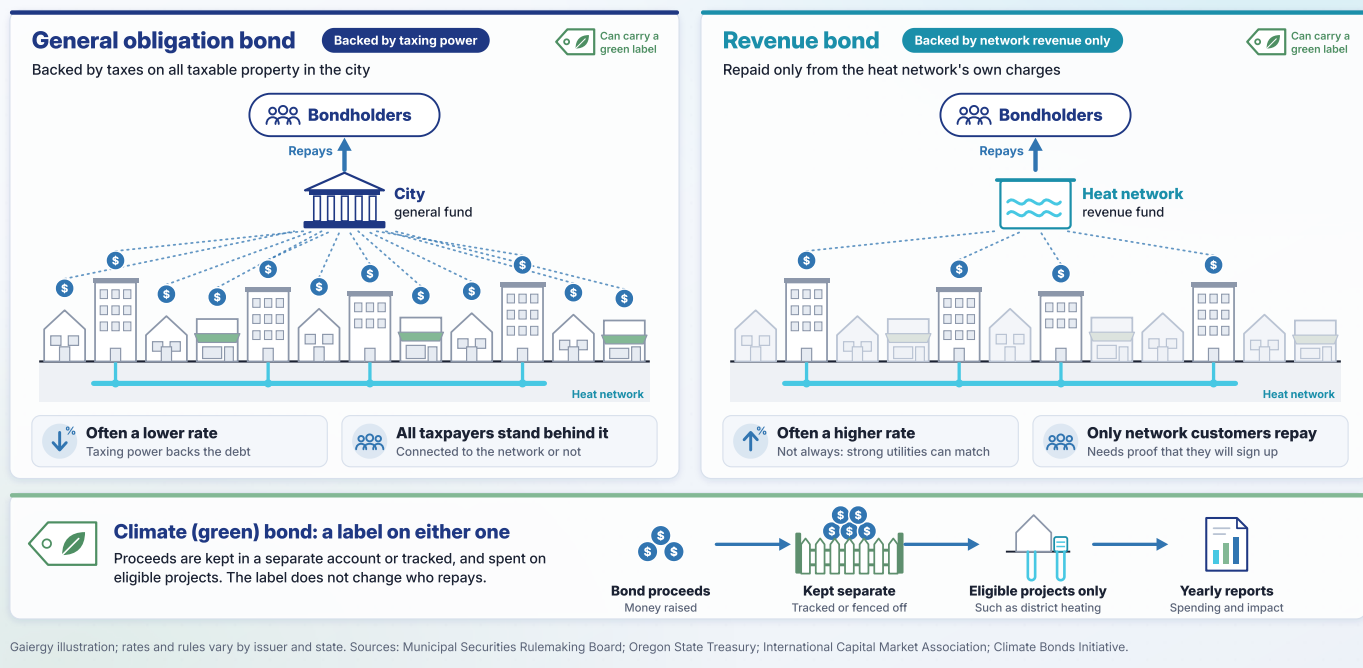


Figure 9. Who pays it back. Left: a GO bond is backed by taxes on all taxable property, connected to the network or not. Right: a revenue bond is repaid only from the network's charges. Bottom: a climate (green) label can go on either bond and controls how the proceeds are spent, not who repays. Gaiergy illustration based on (MSRB, Sources of Repayment⁶¹; Oregon Treasury, Types of Debt⁶²; ICMA Green Bond Principles 2021⁶³; Climate Bonds Standard v4.2⁶⁴)

	 General obligation bond Backed by taxing power	 Revenue bond Backed by network revenue only
WHAT BACKS IT (MSRB, Sources of Repayment ⁶¹ ; SEC Investor.gov ⁶⁰)	The city's taxing power Full faith and credit	Network revenue only No call on taxes
WHO REPAYS (MSRB, Sources of Repayment ⁶¹ ; Oregon Treasury, Types of Debt ⁶²)	All taxpayers Stand behind it, connected or not	Network customers Through their heat charges
TYPICAL RATE (Oregon Treasury, Types of Debt ⁶²) % GAIERGY VIEW	Often lower Broader security	Often higher Not always: strong utilities can match

 VOTE AND DEBT LIMIT (MSRB, Sources of Repayment ⁶¹ ; Oregon Treasury, Types of Debt ⁶² ; M.G.L. c.44 s.10 ⁶⁵)	May need a vote Can count toward a debt limit	Usually no vote Often outside debt limits
 IF CUSTOMERS DO NOT SIGN UP (MSRB, Sources of Repayment ⁶¹ ; SEC Investor.gov ⁶⁰)	Taxpayers cover the gap Holders can usually compel a tax levy	The bond may default No call on city taxes
 FIT FOR A TEN GAIERGY VIEW	Shared public assets Non-users carry the risk	User pays Needs proof of demand first

A GO bond spreads the risk across every taxpayer in the city, including owners whose buildings never connect (MSRB, Sources of Repayment⁶¹; SEC Investor.gov⁶⁰). A city can still repay a GO bond from network charges first, with taxes as the backstop, as Oregon's *"Self-supporting GO bonds"* do (Oregon Treasury, Types of Debt⁶²). A revenue bond puts repayment on the people who use the network, a *"user pays"* approach (Oregon Treasury, Types of Debt⁶²). If the pledged revenue becomes inadequate, *"a default in payment of principal or interest may occur"* (MSRB, Sources of Repayment⁶¹). Revenue bonds often carry extra terms, such as higher coverage requirements and a debt service reserve fund (Oregon Treasury, Types of Debt⁶²). So buyers want proof that customers will connect and pay (Section 4).

GAIERGY VIEW A GO bond often borrows at a lower rate. Oregon's guide says a revenue bond's limited security may mean a higher rate, *"but not always"*. Essential utilities such as water and sewer can borrow at comparable cost (Oregon Treasury, Types of Debt⁶²).

A GO bond may need voter approval, and in Oregon local GO bonds always do (MSRB, Sources of Repayment⁶¹; Oregon Treasury, Types of Debt⁶²). It can also count toward a legal debt limit. In Massachusetts, for example, a city or town may not authorize debt above 5 percent of its equalized valuation, except as the law provides. With approval of the municipal finance oversight board, the limit is 10 percent (M.G.L. c.44 s.10⁶⁵).

Some bonds use both pledges. A *"double-barreled"* bond is secured by a revenue source and by the full faith and credit of an issuer with taxing power (MSRB, Sources of Repayment⁶¹). **GAIERGY VIEW** A city could also split one project. GO bonds could pay for a public well field that serves the whole district, and revenue bonds for the pipes and connections that only customers use. Gaiergy has not found a TEN that has used this split, so it is an option to test with bond counsel. A GO bond fits best when the city sees the network as shared public infrastructure; a revenue bond fits best when signed customers are already in hand.

Climate (green) bonds

A climate or green bond is a label, not a separate type of security. Under the International Capital Market Association (ICMA) Green Bond Principles, a green bond's *"proceeds or an equivalent amount will be exclusively applied"* to eligible green projects. These principles are voluntary guidelines (ICMA Green Bond Principles 2021⁶³). The list of eligible categories includes energy efficiency, *"such as in new and refurbished*

buildings, energy storage, district heating" (ICMA Green Bond Principles 2021⁶³). ICMA lists a green bond with *"full recourse-to-the-issuer"* and a *"Green Revenue Bond"* whose credit exposure is to *"the pledged cash flows"* (ICMA Green Bond Principles 2021⁶³). So a green GO bond is still a GO bond, and a green revenue bond is still a revenue bond.

How the proceeds are kept separate. The Green Bond Principles have four core components: use of proceeds, project evaluation and selection, management of proceeds, and reporting (ICMA Green Bond Principles 2021⁶³). Net proceeds *"should be credited to a sub-account, moved to a sub-portfolio or otherwise tracked by the issuer"*. The issuer should report each year, until all proceeds are spent, on the projects funded, the amounts allocated and their expected impact (ICMA Green Bond Principles 2021⁶³).

The Climate Bonds Standard makes this a certification rule: proceeds *"must be credited to a sub-account, moved to a sub-portfolio, or otherwise identified"*. At least 95 percent of net proceeds go to projects that meet its sector criteria. The issuer either earmarks the money or ring-fences it in *"designated bank accounts that can only fund the specified nominated projects and assets"*. Money not yet spent sits in cash or other permitted temporary holdings (Climate Bonds Standard v4.2⁶⁴).

Two public examples. The Massachusetts State Treasurer wrote that in 2013 the state *"became the first municipal issuer of green bonds in the nation"*. Its green bonds *"are General Obligations of the Commonwealth"* and are not priced at a premium over its other GO bonds. All green bond proceeds *"are held in a segregated account and accounted for separately"*. For its third green issue, a taxable sale that closed July 7, 2016, the state reported 7 investors *"that purchased specifically due to the Green label"* (MA Treasury green bond report 2016⁶⁶).

DC Water, a water and sewer utility, sold its first green bonds in 2014. It said the cost would *"be supported by future ratepayers who will also benefit"* (DC Water, 2014-07-10⁶⁷). **GAIERGY VIEW** For a TEN, a green label can widen the pool of bond buyers. It adds tracking and reporting work. It does not change who repays.

City revenue bonds

A city can issue revenue bonds that are repaid from the network's own charges. Idaho's bond statutes cover a water system for space heating, which is the basis for Boise (Idaho Code 50-1020⁴⁸; Idaho Code 50-1029⁴⁹). The benefit is interest cost. In July 2026, 30-year high-grade municipal bonds yielded about 4.27% and Moody's Aaa corporate bonds about 5.76%, so tax-exempt debt cost about 150 basis points less **ESTIMATE** (Midwest Trust 2026⁶⁸; FRED Aaa⁶⁹). The risk: bond buyers want proof that customers will connect and pay (Section 4).

Private activity bond test. Under 26 USC 141, a bond is a private activity bond if it meets both the private business use test and the private security or payment test (26 USC 141⁷⁰). **GAIERGY VIEW** A network that serves private buildings can meet those tests. The usual route is then an exempt facility bond for *"local district heating or cooling facilities"* under 26 USC 142(a)(9). The statute defines such a system as a pipeline or network providing hot water, chilled water or steam to 2 or more users (26 USC 142⁷¹). Whether an ambient-temperature loop fits that definition is **UNCONFIRMED**, and a question for bond counsel.

63-20 and 501(c)(3) nonprofit corporations

Two kinds of nonprofit corporation can sit at the center of a tax-exempt deal. The names sound alike, but the tax code treats them very differently. The key difference for a TEN: under 63-20, the government ends up owning the network. Under 501(c)(3), the nonprofit can keep owning it (Rev. Rul. 63-20; Rev. Proc. 82-26⁶; 26 USC 145⁷).

What a 63-20 corporation is. It is a corporation organized under a state's general nonprofit corporation law that issues bonds *"on behalf of"* a government (Rev. Rul. 63-20; Rev. Proc. 82-26⁶). If it meets the five conditions of Revenue Ruling 63-20, its bonds are treated as the government's own bonds. The government approves the corporation and each bond issue, holds a beneficial interest while the debt is outstanding, and gets full legal title when the debt is retired (Rev. Rul. 63-20; Rev. Proc. 82-26⁶).

What a 501(c)(3) corporation is. It is a charity: a corporation *"organized and operated exclusively for religious, charitable, scientific, testing for public safety, literary, or educational purposes"* (among other listed purposes), whose net earnings do not benefit any private person. It is exempt from federal income tax (26 USC 501⁷²). It cannot issue tax-exempt bonds in its own name, because the exclusion covers *"an obligation of a State or political subdivision thereof"* (26 USC 103⁷³). Instead, a government issuer sells "qualified 501(c)(3) bonds" for the charity's project. **GAIERGY VIEW** In practice this is often a conduit issuer that lends the proceeds to the charity. The financed property is *"to be owned by a 501(c)(3) organization or a governmental unit"* (26 USC 145⁷), so the charity keeps the asset.

What the IRS requires of a 63-20 corporation. Revenue Ruling 63-20 holds that the bonds of a nonprofit corporation *"will be considered issued on behalf of a governmental unit if"* five conditions are met (Rev. Rul. 63-20; Rev. Proc. 82-26⁶):

1. *"the corporation engages in activities that are essentially public in nature";*
2. *"the corporation is not organized for profit, except to the extent of retiring indebtedness";*
3. *"the corporate income does not inure to any private person";*
4. *"the governmental unit has a beneficial interest in the corporation while the indebtedness is outstanding, and it obtains full legal title to the property of the corporation with respect to which the indebtedness was incurred upon retirement of the indebtedness";* and
5. *"the corporation and the specific obligations to be issued by the corporation have been approved by the governmental unit on whose behalf the obligations are issued."*

Revenue Procedure 82-26, section 3, sets the operating rules the IRS applies before it will rule that the five conditions are met (Rev. Rul. 63-20; Rev. Proc. 82-26⁶):

- **s.3.01, public activities.** The corporation's activities and purposes are *"permitted under the general nonprofit corporation law of the state"*. The financed property is *"located within the geographical boundaries of or has a substantial connection with"* the government.
- **s.3.02, not for profit.** The corporation is organized under the general nonprofit corporation law of the government's state, and its articles say it is *"not organized for profit"*.

- **s.3.03, no private inurement.** The articles provide that *"the corporate income will not inure to any private person, and in fact, the corporate income does not inure to any private person."*
- **s.3.04, government beneficial interest while the debt is outstanding.** One of three: (a) the government has *"exclusive beneficial possession and use"* of property worth 95 percent or more of its fair rental value; (b) the corporation has that use, and the government *"appoints or approves the appointment of at least 80 percent of the members of the governing board"* and can remove members for cause; or (c) the government *"has the right at any time to obtain unencumbered fee title and exclusive possession"* of the property by paying off (defeating) the bonds. Unless the government uses the property under (a), it also gets *"an exclusive option to purchase the property"* for the debt owed if the corporation defaults.
- **s.3.05, full legal title when the debt is retired.** The bonds are issued on behalf of *"no more than one governmental unit"*, and *"unencumbered fee title to the property will vest solely in that governmental unit when the obligations are discharged."* All proceeds go to *"tangible real or tangible personal property"*, not working capital. At payoff the government gets title and possession *"without demand or further action on its part"*, and *"all leases, management contracts, and other similar encumbrances must terminate"*. Before the bonds are issued, the government adopts a resolution that *"it will accept title"*. Later refunding or improvement bonds end by the original final maturity date. Insurance money rebuilds the property or goes to the government. At final maturity the property keeps at least *"20 percent of the original cost"* in value and a remaining useful life of *"the longer of one year or 20 percent"* of its original life. (The refunding-date rule and the value and life rule do not apply where the government uses the property under s.3.04(a).)
- **s.3.06, government approval.** This is met if, *"within one year prior to the issuance of the obligations, the governmental unit adopts a resolution approving the purposes and activities of the corporation and the specific obligations to be issued by the corporation."* One resolution can cover a series of bonds for one project issued over up to five years.

Section 4 adds rules for refunding bonds (Rev. Rul. 63-20; Rev. Proc. 82-26⁶). Revenue Procedure 82-26 describes when the IRS will *"ordinarily issue an advance ruling"*, and it says its operating rules *"are not to be used as tests for determining the taxability of bond interest"* (Rev. Rul. 63-20; Rev. Proc. 82-26⁶). Revenue Procedure 2026-1 still points ruling requests for "on behalf of" issuers to Revenue Procedure 82-26 (IRS Rev. Proc. 2026-1⁷⁴).

GAIERGY VIEW A deal that misses any of the five conditions cannot rely on Revenue Ruling 63-20 to treat its bonds as the government's. It would need another legal basis, which is a question for bond counsel.

How a 63-20 corporation can be used for a TEN.

- **It can** hold a public-purpose network and issue tax-exempt bonds for it during the bond term, if the network is in or closely tied to the sponsoring government (Rev. Rul. 63-20; Rev. Proc. 82-26⁶).
- **It can** repay the bonds from network revenue or from payments by the government. **GAIERGY VIEW** Revenue Procedure 82-26 does not limit the source of repayment.
- **It can** hire a private builder and operator under contract. Revenue Procedure 82-26 expects management contracts, since they end at payoff (Rev. Rul. 63-20; Rev. Proc. 82-26⁶). Bonds issued on behalf of a government are still tested under 26 USC 141: an issue is a private activity bond if *"more than 10 percent of the proceeds"* go to private business use and the payment or security test is also met (26 USC 141⁷⁰). **GAIERGY VIEW** So an operator contract has limits, and its terms are a question for bond counsel.

- **Whether it keeps the debt off the city's own books** is **UNCONFIRMED**. The saved sources do not address it.
- **It cannot** keep the network after the bonds are paid. Title vests solely in one government, and leases and management contracts end (Rev. Rul. 63-20; Rev. Proc. 82-26⁶).
- **It cannot** pay profit to any private person, or use bond money for working capital (Rev. Rul. 63-20; Rev. Proc. 82-26⁶).
- **It cannot** act without government approval of the corporation and of each bond issue (Rev. Rul. 63-20; Rev. Proc. 82-26⁶).
- **It cannot** keep a nonprofit or a co-op as the long-term owner. **GAIERGY VIEW** That follows from the title rule above. That plan fits a 501(c)(3) owner with qualified 501(c)(3) bonds better, or a 501(c)(12) member co-op ([below](#)).

Side by side.

QUESTION	63-20 CORPORATION	501(C)(3) CORPORATION	501(C)(12) COOPERATIVE (NEXT SUBSECTION)
Legal source of status	Revenue Ruling 63-20 and Revenue Procedure 82-26. Organized under the state's general nonprofit corporation law (s.3.02) (Rev. Rul. 63-20; Rev. Proc. 82-26 ⁶)	26 USC 501(c)(3). Exempt from federal income tax under s.501(a) (26 USC 501 ⁷²)	26 USC 501(c)(12)(A): <i>"mutual ditch or irrigation companies, mutual or cooperative telephone companies, or like organizations"</i> . Exempt from federal income tax under s.501(a) (26 USC 501 ⁷²). The IRS counts water and sewer co-ops as like organizations (IRS Publication 557 ¹⁹)
Who issues the bonds	The corporation itself, on behalf of one government (Rev. Rul. 63-20; Rev. Proc. 82-26 ⁶)	A state or local government issuer. The charity cannot issue tax-exempt bonds in its own name (26 USC 103 ⁷³)	Not the co-op. The exclusion covers <i>"an obligation of a State or political subdivision thereof"</i> (26 USC 103 ⁷³). GAIERGY VIEW A government issuer can sell exempt facility bonds for the co-op's network, or the co-op borrows from a lender

QUESTION	63-20 CORPORATION	501(C)(3) CORPORATION	501(C)(12) COOPERATIVE (NEXT SUBSECTION)
What kind of bonds	Treated as <i>"obligations of a state or a political subdivision"</i> (s.1) (Rev. Rul. 63-20; Rev. Proc. 82-26 ⁶)	Qualified 501(c)(3) bonds: private activity bonds that meet s.145 (26 USC 145 ⁷)	Not qualified 501(c)(3) bonds (26 USC 145 ⁷). Exempt facility bonds for <i>"local district heating or cooling facilities"</i> (s.142(a)(9)); s.142(b)(1) requires government ownership only for paragraphs (1), (2), (3) and (12) (26 USC 142 ⁷¹). Or co-op loans, from lenders that serve rural utilities: CoBank serves <i>"rural power, water and digital infrastructure providers"</i> (CoBank ⁷⁵); the National Rural Utilities Cooperative Finance Corporation (CFC) was <i>"Created and owned by America's electric cooperative network"</i> (CFC ⁷⁶). A loan to a thermal co-op: UNCONFIRMED
Owner while the bonds are out	The corporation, with a government beneficial interest (s.3.04) (Rev. Rul. 63-20; Rev. Proc. 82-26 ⁶)	A 501(c)(3) organization or a governmental unit (s.145(a)(1)) (26 USC 145 ⁷)	The co-op, which its members own. Members <i>"choose the management"</i> and get service at cost (IRS Publication 557 ¹⁹)
Owner after the bonds are paid	The government. Title <i>"will vest solely in that governmental unit"</i> (s.3.05) (Rev. Rul. 63-20; Rev. Proc. 82-26 ⁶)	The nonprofit can keep it. Section 145 has no rule that passes title to a government (26 USC 145 ⁷)	The co-op keeps it. Section 501(c)(12) has no rule that passes title to a government (26 USC 501 ⁷²). Members have the right <i>"to share in any assets upon dissolution"</i> (IRS Publication 557 ¹⁹)

QUESTION	63-20 CORPORATION	501(C)(3) CORPORATION	501(C)(12) COOPERATIVE (NEXT SUBSECTION)
Government control and approval	Approves the corporation and each issue within one year before issue (s.3.06). Also uses the property, or appoints at least 80% of the board, or can take title at any time by paying off the bonds (s.3.04) (Rev. Rul. 63-20; Rev. Proc. 82-26 ⁶)	The issue is approved under s.147(f) (next row) (26 USC 147 ⁷⁷). Section 145 sets no board or title rule for the government (26 USC 145 ⁷)	No federal tax rule gives a government control of the co-op. Members have the right “to choose the management” (IRS Publication 557 ¹⁹). An exempt facility bond issue is approved under s.147(f) (26 USC 147 ⁷⁷). State utility regulation of a thermal co-op: UNCONFIRMED
Public hearing (26 USC 147(f))	Section 147(f) is written for private activity bonds (26 USC 147 ⁷⁷). A 63-20 deal relies on the government resolution (s.3.06) (Rev. Rul. 63-20; Rev. Proc. 82-26 ⁶)	Yes. Approval “by the applicable elected representative” after “a public hearing following reasonable public notice”, or by voter referendum (26 USC 147 ⁷⁷)	Only if exempt facility bonds are used. Then the s.147(f) hearing and approval apply. A co-op loan is not a private activity bond, so s.147(f) does not apply (26 USC 147 ⁷⁷)
State volume cap (26 USC 146)	Section 146 caps private activity bonds (26 USC 146 ⁷⁸). Not needed if the bonds pass the s.141 tests (26 USC 141 ⁷⁰)	Not needed. For the cap, “private activity bond” does not include “any qualified 501(c)(3) bond” (s.146(g)(2)) (26 USC 146 ⁷⁸)	Needed for district heating exempt facility bonds. Sections 146(g) and 146(h) do not leave out s.142(a)(9) bonds (26 USC 146 ⁷⁸ ; 26 USC 142 ⁷¹). A co-op loan is not a private activity bond, so the cap does not apply (26 USC 146 ⁷⁸)

QUESTION	63-20 CORPORATION	501(C)(3) CORPORATION	501(C)(12) COOPERATIVE (NEXT SUBSECTION)
Private business use limit	10 percent of proceeds, plus the 10 percent payment or security test (s.141(b)) (26 USC 141 ⁷⁰)	5 percent of net proceeds: s.141(b) applies “by substituting ‘5 percent’ for ‘10 percent’” and “‘net proceeds’ for ‘proceeds’” (s.145(a)(2)(B)) (26 USC 145 ⁷)	The s.145 5 percent rule does not apply (26 USC 145 ⁷). Exempt facility bonds: 95 percent or more of net proceeds go to the facility (s.142(a)) (26 USC 142 ⁷¹). For the co-op's own exemption, the limit is the 85 percent member income test, applied each year (26 USC 501 ⁷² ; IRS Publication 557 ¹⁹)
Does the entity need 501(c)(3) status?	No. Revenue Procedure 82-26 requires a state nonprofit corporation, and s.3.04 refers to one that “is not an organization described in section 501(c)(3)” (Rev. Rul. 63-20; Rev. Proc. 82-26 ⁶)	Yes, unless the owner is a governmental unit (s.145(a)(1)) (26 USC 145 ⁷)	No. It needs 501(c)(12) status, and keeps it only in years when 85 percent or more of its income comes from members (26 USC 501 ⁷² ; IRS Publication 557 ¹⁹)
Federal credit by direct pay (26 USC 6417)	The government owner after payoff is eligible (“any State or political subdivision thereof”). The corporation itself: UNCONFIRMED (26 USC 6417 ⁷⁹)	Eligible as “any organization exempt from the tax imposed by subtitle A” (26 USC 6417 ⁷⁹ ; 26 USC 501 ⁷²)	Eligible as “any organization exempt from the tax imposed by subtitle A” (26 USC 6417 ⁷⁹ ; 26 USC 501 ⁷²). For a tax-exempt electric co-op, the IRS says direct pay “does not affect the 85-percent income test” (IRS elective pay FAQ ⁸⁰). For a thermal co-op: UNCONFIRMED
Fits which long-term plan	GAIERGY VIEW The city or other government ends up owning the network	GAIERGY VIEW A nonprofit keeps owning the network	GAIERGY VIEW The buildings on the network own it together and pay at cost, like a mutual water company

GAIERGY VIEW In plain terms: 63-20 fits when the plan is for the government to own the network at bond payoff. A 501(c)(3) owner with qualified 501(c)(3) bonds fits when a nonprofit is to keep it. A 501(c)(12) member co-op fits when the buildings on the network are to own it together.

Where the title goes

🔑 = title to the network

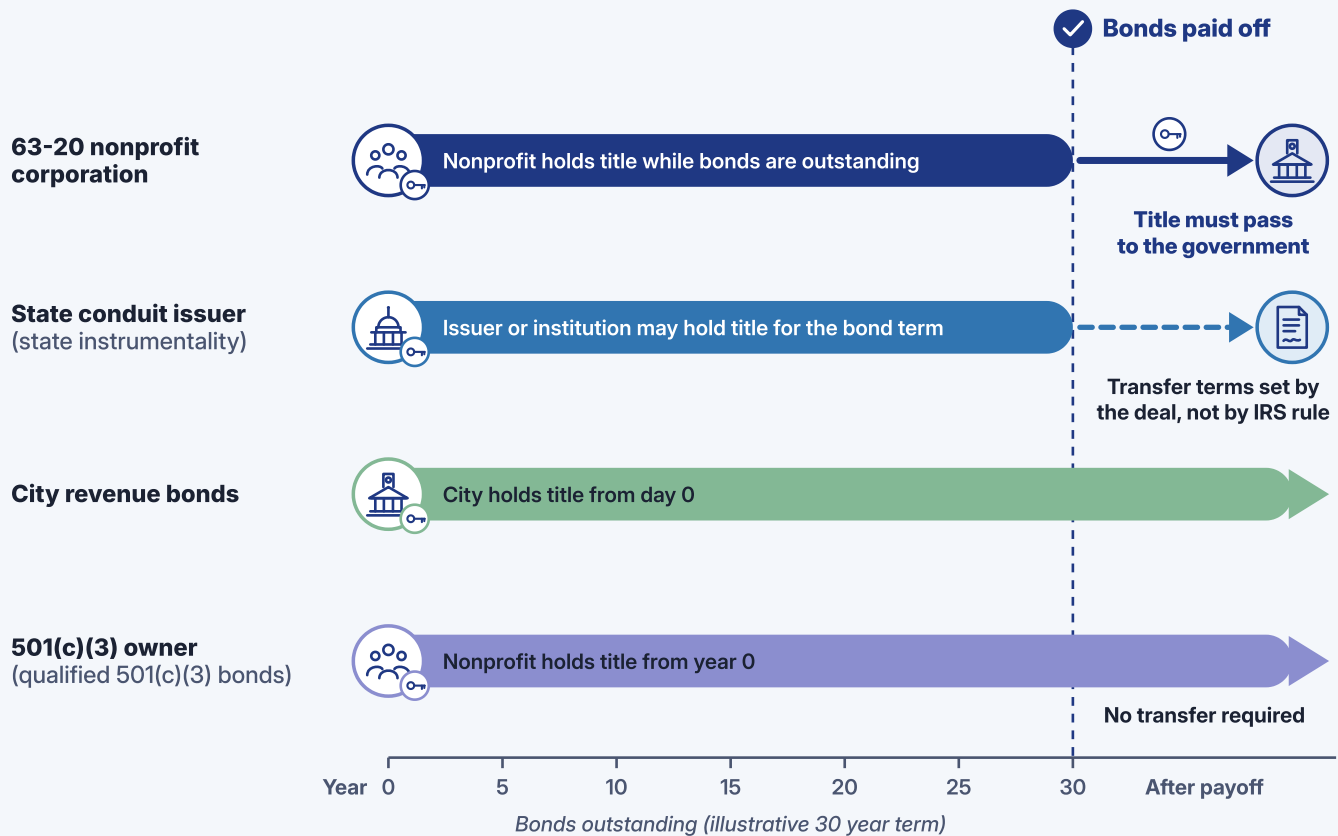


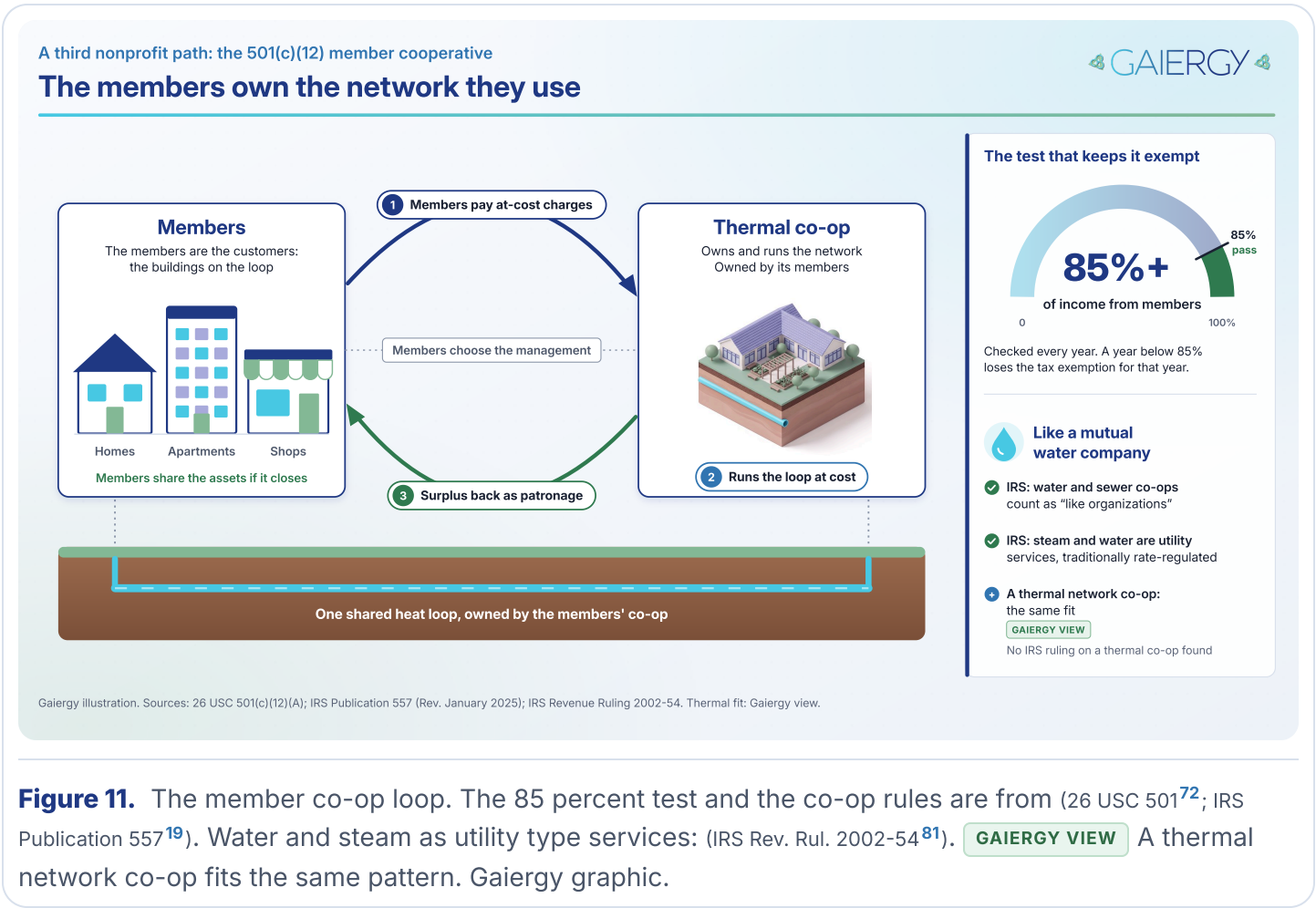
Figure 10. Where the title goes. Under a 63-20 deal, title passes to the government when the bonds are paid off. A 501(c)(3) owner financed with qualified 501(c)(3) bonds can keep title (26 USC 145⁷). The 30-year term is illustrative. Gaiergy graphic based on (Rev. Rul. 63-20; Rev. Proc. 82-26⁶)

A third nonprofit path: the 501(c)(12) member cooperative

Federal tax law also exempts “mutual ditch or irrigation companies, mutual or cooperative telephone companies, or like organizations” (26 USC 501⁷²). The exemption holds “only if 85 percent or more of the income consists of amounts collected from members for the sole purpose of meeting losses and expenses” (26 USC 501⁷²). The IRS counts co-ops that provide “water and sewer services” or “natural gas services” as like organizations (IRS Publication 557¹⁹). Revenue Ruling 2002-54 treats “electricity, gas, steam or water” as public utility type services, traditionally with rates set or approved by a state or similar body, and with extensive infrastructure (IRS Rev. Rul. 2002-54⁸¹). **GAIERGY VIEW** A thermal network that moves heat in water pipes to its members can be organized the same way as a mutual water company. Gaiergy did not find an IRS ruling on a thermal network co-op, so how the IRS would treat one is **UNCONFIRMED**.

The members are the customers. They “choose the management”, get service at cost, and get any surplus back as patronage (IRS Publication 557¹⁹). Section 501(c)(12) has no rule that passes title to a government, so the co-op keeps the network (26 USC 501⁷²). One caution: the exclusion for government grants covers only

telephone and electric co-ops (26 USC 501⁷²; IRS Publication 557¹⁹). **GAIERGY VIEW** So a large grant can count as non-member income and put a thermal co-op below 85 percent in that year.



State conduit issuers and instrumentalities

A conduit issuer lends its name to a bond. The borrower repays it from project revenue. These entities get

their powers from a state statute, not from the 63-20 ruling. Examples:



501(c)(3) development corporations

Many cities work through a nonprofit development corporation. The Baltimore Development Corporation (BDC) is a 501(c)(3) with a tax exemption issued in January 1992 (ProPublica, BDC⁸⁸). The New York City Economic Development Corporation (NYCEDC) describes itself as "a mission-driven, nonprofit organization" (NYCEDC 2026⁸⁹). GAIERGY VIEW These groups can plan, assemble sites and run procurements. Being a

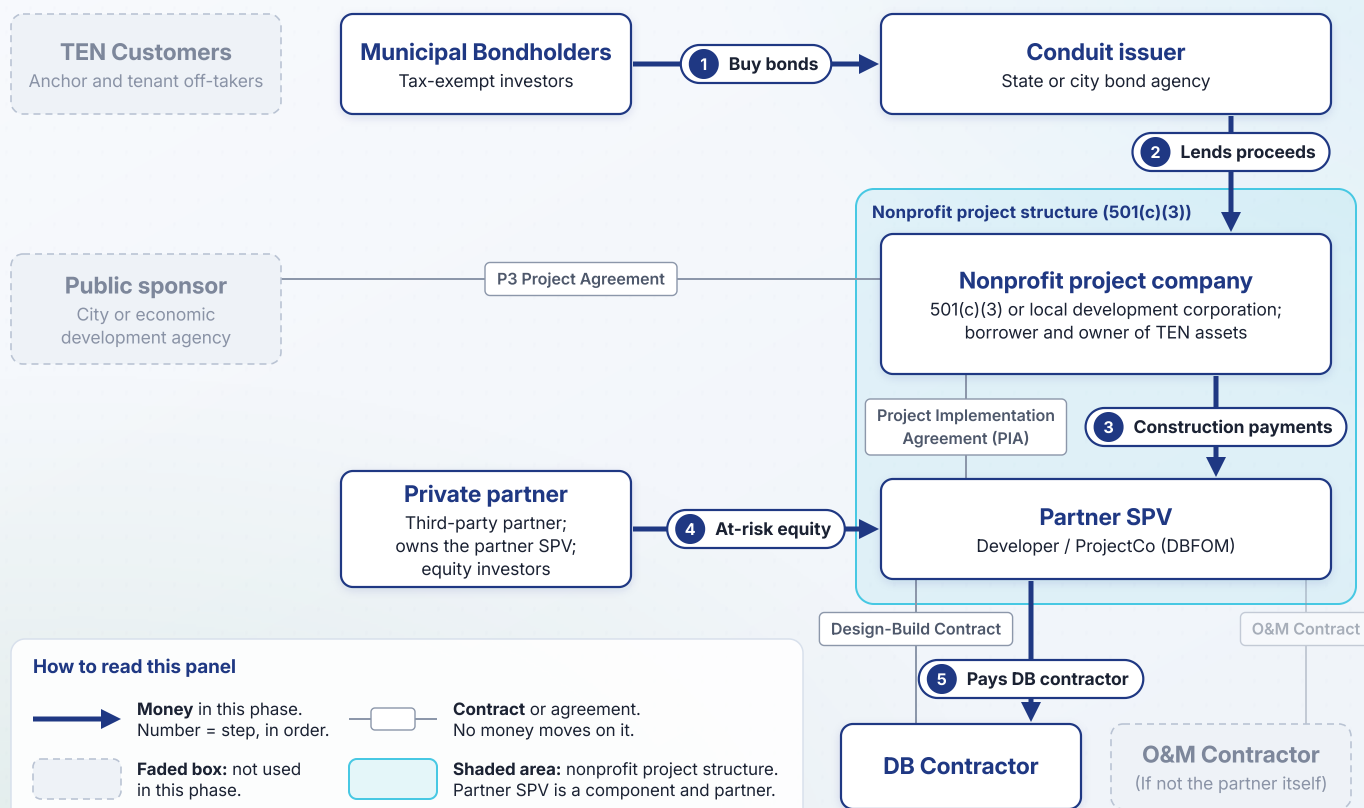
nonprofit does not make them a 63-20 corporation. A 501(c)(3) can still borrow tax-exempt money through a conduit issuer, if it owns the financed assets and meets 26 USC 145 (26 USC 145⁷).

Putting it together: a tax-exempt P3

GAIERGY VIEW A tax-exempt public-private partnership (P3) can combine these pieces. A public sponsor, such as a city or its economic development agency, signs a P3 Project Agreement with a nonprofit project company. The nonprofit company borrows through a conduit issuer and owns the network. A private partner, a third-party company, forms a partner special purpose vehicle (SPV) and owns it. The partner SPV designs, builds, finances, operates and maintains the network under a Project Implementation Agreement (Figures 12 and 13).

Who owns what. The 501(c)(3) nonprofit project company owns the network and keeps its nonprofit status. The private partner's SPV designs, builds, finances, operates and maintains the network as a component of, and a partner in, the nonprofit structure. Partners in the structure do not have to be nonprofits: a private partner can be a contractor within the 501(c)(3) structure or a partner in it.

GAIERGY VIEW During construction, bond money flows from bondholders through the conduit issuer to the nonprofit company, which pays the partner SPV to build. The private partner adds at-risk equity. Once the network runs, customers pay thermal service charges to the public sponsor, and the sponsor makes availability payments to the nonprofit company. The nonprofit company pays debt service to bondholders and pays the partner SPV its return, tax and operating costs. The partner SPV is a component of, and a partner in, the nonprofit project structure.

Panel 1 of 2 **Build it: where the construction money goes****Construction money, step by step**

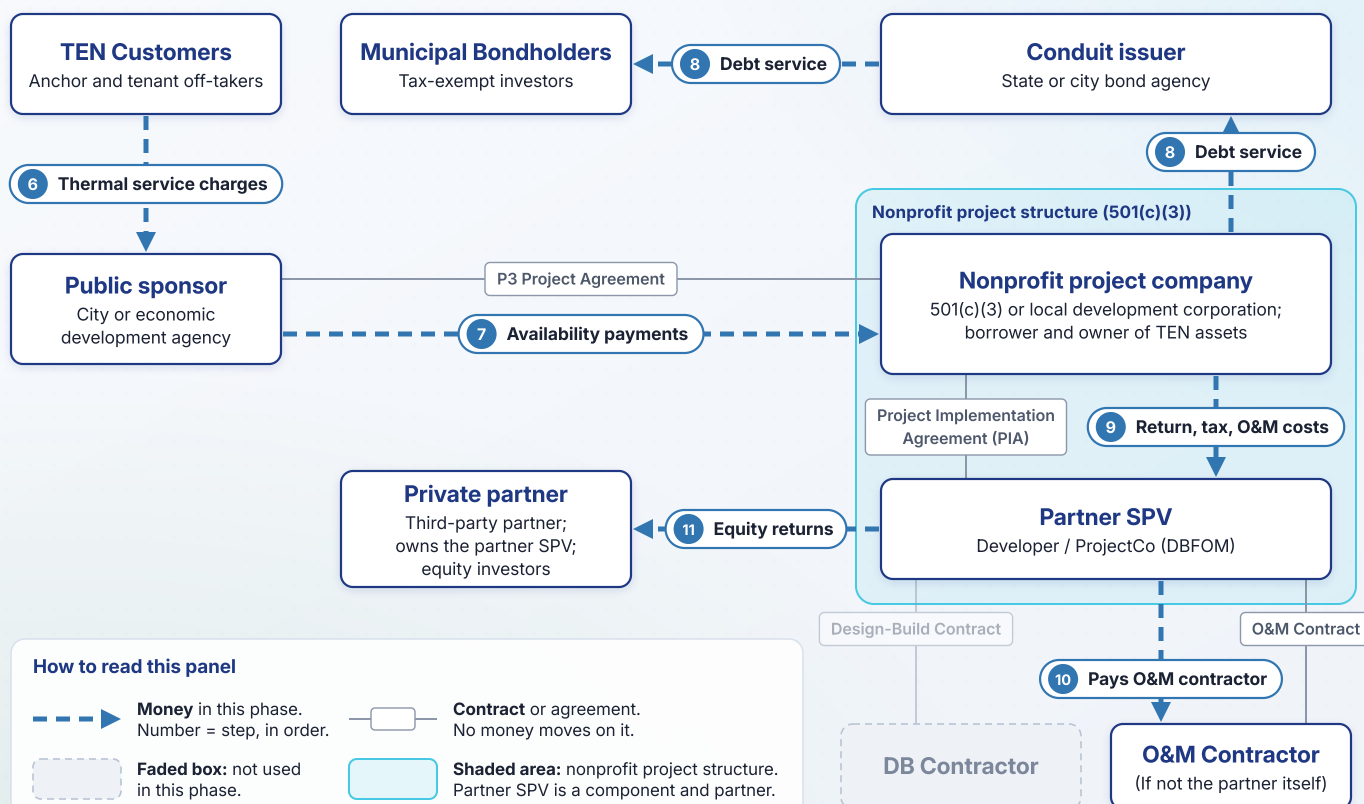
- 1 Bondholders buy tax-exempt bonds issued by the conduit issuer.
- 2 The conduit issuer lends the bond proceeds to the nonprofit project company.
- 3 The nonprofit project company pays the partner SPV design and construction payments under the PIA.
- 4 The private partner contributes at-risk equity to the partner SPV.
- 5 The partner SPV pays the DB contractor.

Terms used

TEN: thermal energy network
P3: public-private partnership
SPV: special purpose vehicle
DBFOM: design, build, finance, operate, maintain
PIA: Project Implementation Agreement
O&M: operations and maintenance
DB: design-build

Gaergy illustration of a typical tax-exempt public-private partnership structure for a TEN. Illustrative; each deal differs.

Figure 12. Build it: where the construction money goes. Solid arrows are construction money, numbered in order. Thin lines are contracts; faded boxes are not used in this phase. The shaded area is the nonprofit project structure. Gaergy illustration of a typical tax-exempt P3 structure for a TEN; illustrative, each deal differs.

Panel 2 of 2 **Run it: where the operating money goes****Operating money, step by step**

- 6 Customers pay thermal service charges to the public sponsor.
- 7 The public sponsor pays availability payments to the nonprofit project company.
- 8 The nonprofit project company pays bondholders debt service through the conduit issuer.
- 9 The nonprofit project company pays the partner SPV its return, tax and O&M costs.
- 10 The partner SPV pays the O&M contractor, if one is used.
- 11 The partner SPV distributes equity returns to the private partner.

Terms used

TEN: thermal energy network
P3: public-private partnership
SPV: special purpose vehicle
DBFOM: design, build, finance, operate, maintain
PIA: Project Implementation Agreement
O&M: operations and maintenance
DB: design-build

Gaiergy illustration of a typical tax-exempt public-private partnership structure for a TEN. Illustrative; each deal differs.

Figure 13. Run it: where the operating money goes. Dashed arrows are operating money, numbered in order. The partner SPV is a component of, and a partner in, the nonprofit project structure (shaded). Gaiergy illustration of a typical tax-exempt P3 structure for a TEN; illustrative, each deal differs.

Why the nonprofit owner matters for the bonds. Because the nonprofit company owns the network, the deal can use qualified 501(c)(3) bonds. These require that *“all property which is to be provided by the net proceeds of the issue is to be owned by a 501(c)(3) organization or a governmental unit”* (26 USC 145⁷). They sit outside the state volume cap: for the cap, the term private activity bond does not include *“any qualified 501(c)(3) bond”* (26 USC 146⁷⁸). An exempt facility bond for *“local district heating or cooling facilities”* under 26 USC 142(a)(9) has no such exception. Sections 146(g) and 146(h) list the exempt facility bonds left out of the cap, in whole or in part, and paragraph (9) is not among them (26 USC 146⁷⁸; 26 USC 142⁷¹). A private activity bond is a qualified bond only if its issue *“meets the applicable requirements of section 146”* (26 USC 141⁷⁰). So a district heating bond draws on the state's volume cap.

GAIERGY VIEW For a TEN, that is the main appeal of a nonprofit owner: its bonds do not compete for volume cap with housing and other private activity bonds. Whether a given deal qualifies is a question for bond counsel.

Tax increment financing (TIF)

TIF repays debt from the growth in property tax inside a set district. **WORKING DEFINITION** **GAIERGY VIEW** It can fit a TEN that serves a new development district, where new buildings create the tax growth. It is harder to use for a retrofit of an existing district with flat tax values.

Green banks

NY Green Bank is *“a division of NYSERDA,”* the New York State Energy Research and Development Authority (NY Green Bank⁹⁰). In Maryland, MCEC and the City of Baltimore report a \$121M pipeline of geothermal projects (ICLEI USA and MCEC 2026⁹¹). **GAIERGY VIEW** Green banks can fill gaps that bond buyers and commercial lenders avoid, such as early-stage or first-of-a-kind risk.

Federal tax credits after the 2025 tax law

- **Geothermal heat pump credit (IRC s.48).** 30% (with prevailing wage and apprenticeship rules, or under 1 MW) if construction begins before 2033. Then 26% in 2033, 22% in 2034, and none after. Adders for domestic content and energy communities still exist (26 USC 48⁴).
- **One owner.** Under Treasury final rules, the credit owner owns the ground loop and at least one connected heat pump (Treasury T.D. 10015²).
- **New IRC 50(e).** The One Big Beautiful Bill Act (OBBBA) added a rule: ownership of geothermal heat pump property is decided *“without regard to whether such property is readily usable by a person other than the lessee or service recipient”* (Pub. L. 119-21⁹²). The reading that this helps third-party loop ownership is an inference with no IRS guidance yet **UNCONFIRMED**.
- **Direct pay.** Under 26 USC 6417, an “applicable entity” can take the credit as a cash payment. The list includes tax-exempt organizations, states and their political subdivisions, the Tennessee Valley Authority, tribal governments, Alaska Native Corporations and rural electric co-ops (26 USC 6417⁷⁹). Other owners can sell the credit under 26 USC 6418 (26 USC 6418⁹³).

- **Tax-exempt bond cut.** Section 48(a)(4) applies the rule of 45(b)(3): the credit is reduced by the share financed with tax-exempt bonds, up to 15% (26 USC 48⁴; 26 USC 45³).
- **Direct pay and domestic content.** For direct pay, s.48(a)(13) applies rules similar to 45(b)(10) (26 USC 48⁴). Under 45(b)(10), the credit is multiplied by an "applicable percentage." It is 100% for a facility that meets the domestic content rules or has "*a maximum net output of less than 1 megawatt (as measured in alternating current).*" For other facilities, the codified text sets 100% if construction began before 2024 and 90% if it began in 2024. It states no percentage for later years. Treasury exceptions apply if US content raises construction cost by more than 25% or is not available (26 USC 45³). **GAIERGY VIEW** A direct-pay project of 1 MW or more that starts in 2026 and does not meet domestic content risks losing some or all of the credit; the exact result is **UNCONFIRMED**. The text also does not say how the 1 MW (AC) test applies to a heat pump system, which produces heat, not electricity **UNCONFIRMED**.
- **No dedicated TEN credit.** There is no federal credit written for TENs. The geothermal direct use fallback credit is 0% for construction starting on or after 2025-06-16 (26 USC 48⁴; Pub. L. 119-21⁹²).
- **DOE pilots.** DOE selected five community geothermal projects in December 2024: Chicago; Ann Arbor, Michigan; Framingham, Massachusetts; Hinesburg, Vermont; and Shawnee, Oklahoma (Utility Dive 2024¹¹). The DOE page now lists three: Ann Arbor, Framingham and Shawnee (DOE 2026¹²). The Framingham contract (\$8.6M) was finalized on 2025-09-30 (Canary Media 2025²¹).

Get the label right. A nonprofit is not a 63-20 corporation by default. A state conduit issuer is not a 63-20 corporation. A 501(c)(3) does not issue tax-exempt bonds in its own name, but it can borrow them through a conduit issuer if it owns the financed assets and meets 26 USC 145 (26 USC 145⁷). Each has a different legal source of power, a different end state for title, and different approvals: under 63-20 the government ends up owning the network, and under 501(c)(3) the nonprofit can keep owning it (Rev. Rul. 63-20; Rev. Proc. 82-26⁶; 26 USC 145⁷). **GAIERGY VIEW** Gaiergy recommends that a project name each entity by what it is in law, and pick the one whose end state matches the long-term ownership plan.

Paying it back over 40 to 60 years

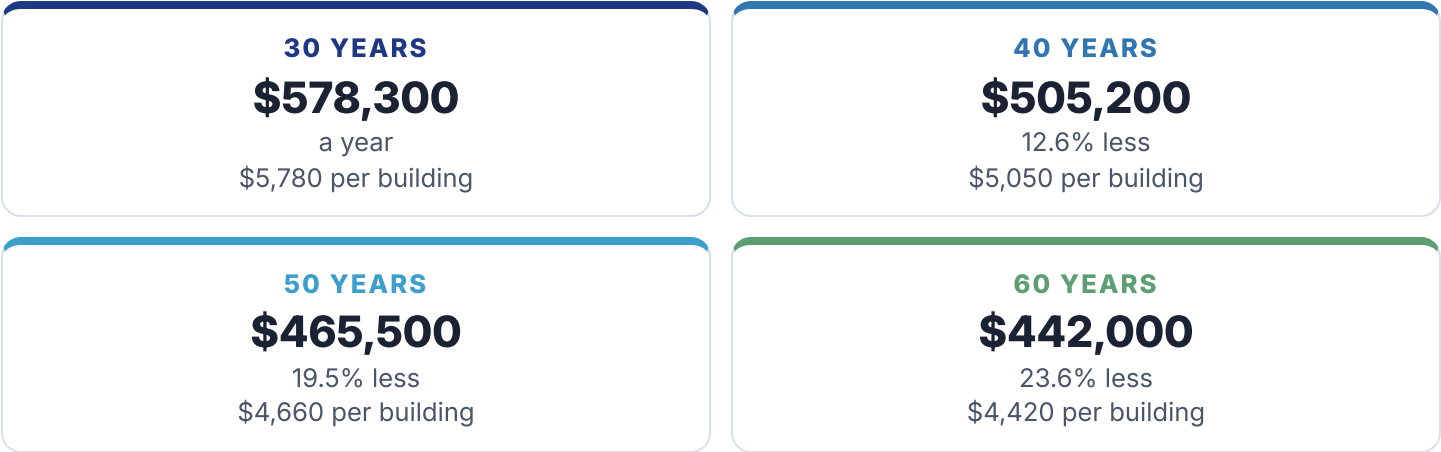
What this section shows: how a longer repayment term lowers the yearly cost of a TEN, where public bodies already repay or recover long-lived assets over more than 30 years, how a new bond can extend an old one, and the limits on doing so. The dollar example is **ILLUSTRATIVE**, not a forecast.

GAIERGY VIEW A TEN is a large, up-front build, and much of the cost is pipe and wells in the ground. If that cost is repaid over 25 or 30 years, the yearly charge to each building can be too high for many owners to join. A longer term spreads the same cost over more years, so each year's share is smaller.

Public finance already works this way. The Government Finance Officers Association (GFOA) describes debt as a way “to spread the cost of significant long-term assets over their useful life” (GFOA, Debt Management Policy⁹⁴). When DC Water sold a 100-year bond for its sewer tunnels, it said the bond lets it “spread the costs of the project over the minimum expected life of the tunnels and be supported by future ratepayers who will also benefit” (DC Water, 2014-07-10⁶⁷).

The math: what a longer term does

ILLUSTRATIVE Take \$10 million of network cost, borrowed at a fixed 4% and repaid in level yearly payments, shared equally by 100 buildings. The 4% rate is a round example, not a forecast. Level debt service means “the combined annual amount of principal and interest payments remains relatively constant over the life of the issue of bonds” (MSRB Glossary 2013⁹⁵).



ILLUSTRATIVE Moving from 30 to 60 years cuts the yearly payment by 23.6%. Per building, the debt part of the charge falls from about \$482 a month to about \$368. The trade-off is total interest, which rises from \$7.3 million over 30 years to \$16.5 million over 60 years.

A longer term lowers the yearly payment

Same \$10 million network, same 4% interest, level yearly payments

ILLUSTRATIVE



Read it like this

Tall bar

= what the network owes each year

Per building

= that payment shared by 100 buildings

% less

= saving against a 30-year term

Amber bars

= total interest, which grows

The trade-off: total interest paid over the whole term



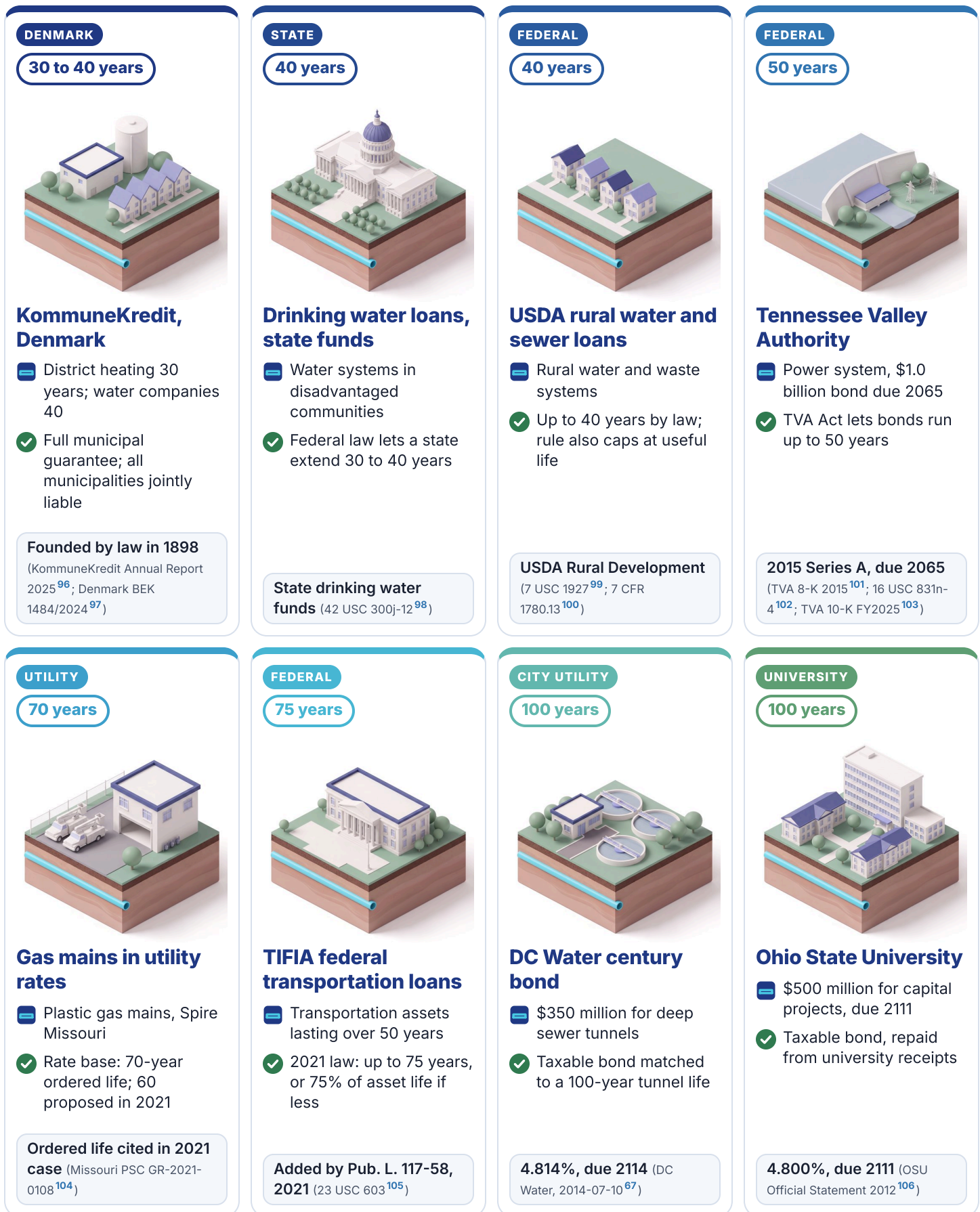
Gaiergy illustration. ILLUSTRATIVE, not a forecast: \$10 million borrowed at a fixed 4% with level yearly payments; 100 buildings share the cost equally.

Figure 14. A longer term lowers the yearly payment. ILLUSTRATIVE, not a forecast: \$10 million at a fixed 4%, level yearly payments, 100 buildings sharing the cost equally. The amber strip shows the trade-off: total interest rises with the term. Gaiergy illustration.

Who already pays back over more than 30 years

Federal programs, state funds, a city water utility, a public university, a regulated gas utility and Denmark's municipal lender all repay or recover long-lived assets over more than 30 years. Each one rests on a specific structure: a statute, a federal program rule, a guarantee, a pledge of utility or university revenue, or a utility rate base. The cards run from the shortest term to the longest.





▢ What it paid for ✓ What made the long term possible. Every card is sourced; the term chip is the term each source states for that asset.

Some federal and state programs stop short of 40 years. The Water Infrastructure Finance and Innovation Act (WIFIA) program lends to water projects with a final maturity up to “35 years after the date of substantial completion”, and no later than the useful life (33 USC 3908¹⁰⁷). Clean Water State Revolving Fund loans run up to “the lesser of 30 years and the projected useful life” of the project (33 USC 1383¹⁰⁸).

How the debt gets extended

Every bond has a final maturity. To keep paying over a longer life, an issuer can sell a new bond and use the money to pay off the old one. This is a refunding: “A procedure whereby an issuer refinances outstanding bonds by issuing new bonds” (MSRB Glossary 2013⁹⁵).

- 1 Bond 1 builds the network.** Network charges repay it. **GAIERGY VIEW** It can repay principal on a schedule longer than its own 30-year term, so a balance is still owed at year 30. Whether state law and investors accept that shape is a question for bond counsel.
- 2 A refunding bond pays off the balance.** Its proceeds go “to pay principal, interest, or redemption price on another issue” (26 CFR 1.150-1¹⁰⁹).
- 3 Bond 2 repays the rest.** A refunding can “restructure the stream of debt service payments” (GFOA, Refunding Municipal Bonds¹¹⁰). **GAIERGY VIEW** A further refunding is possible only while the asset has life left and the law allows it.

Repayment can follow the life of the pipe

ILLUSTRATIVE

Bond 1 leaves a balance at year 30. A new bond pays it off, so repayment follows the life of the network.

The network

underground pipe and wells

Keeps working long after the first bond is paid

Bond 1

30-year term

Repays part; balance due at year 30

Bond 2

30-year refunding bond

Repays the balance

Optional, if rates or needs change

Bond 3

optional, if needed

Optional refunding

Debt part of

the yearly charge

One 30-year bond: higher charge, debt-free at year 30

Refunded to 60 years: about 24% lower, paid longer

Year 0 10 20 30 40 50 60 70

Limits: each new bond fits inside the life left in the asset, under state law and federal tax rules.

Each refunding takes on new interest rate risk, and a longer term means more total interest.

Gaiergy illustration. ILLUSTRATIVE: years, bond terms and asset life are examples, not a plan or a forecast.

Figure 15. Repayment can follow the life of the pipe. Bond 1 leaves a balance at year 30; a refunding bond pays it off, so repayment continues while the network keeps working. The yearly charge lines are drawn to the scale of Figure 14. Years, terms and asset life are ILLUSTRATIVE. Gaiergy illustration based on (MSRB Glossary 2013⁹⁵; 26 CFR 1.150-1¹⁰⁹).

Current refunding, not advance. A current refunding is issued “not more than 90 days before” its proceeds finish paying off the old bonds; any other refunding is an advance refunding (26 CFR 1.150-1¹⁰⁹). Interest on a bond “issued to advance refund another bond” is not tax-exempt (26 USC 149(d)¹¹¹). That rule applies to advance refunding bonds issued after December 31, 2017 (Pub. L. 115-97, s.13532¹¹²). A taxable advance refunding is still possible, but GFOA notes “the higher interest cost relative to tax-exempt bonds should be considered” (GFOA, Refunding Municipal Bonds¹¹⁰). **GAIERGY VIEW** A TEN plan that counts on tax-exempt refundings would issue each new bond no more than 90 days before it pays off the old one.

Level or back-loaded. Level debt service keeps the yearly payment about the same (MSRB Glossary 2013⁹⁵).

GAIERGY VIEW A back-loaded schedule pays less in the early years, while buildings are still connecting, and more later. It lowers early charges, but it adds interest and risk if connections lag.

A federal loan first, bonds later. **GAIERGY VIEW** A project could borrow from a long-term federal loan program during construction, then refinance with bonds once customers are connected and paying.

Whether a given program allows prepayment or refinancing on these terms is **UNCONFIRMED** and depends on each loan agreement.

Limits to plan for

⚠️ State useful-life caps

Some states, such as New York, tie local debt to the life of the asset. New York bars debt *“for a period longer than the period of probable usefulness”* (NY Local Finance Law 11.00¹¹³). Its table gives water systems *“forty years”* (fifty in New York City), but *“Hot water heating plants or distribution systems”* get *“thirty years”* (NY Local Finance Law 11.00¹¹³). A refunding bond can run no later than the longest period the law allows when the old or the new bonds are issued, *“computed from the date of issuance of the bonds to be refunded”* (NY Local Finance Law 90.00¹¹⁴). Denmark caps municipal-guaranteed loans for energy supply networks at 30 years, but allows 40 for water companies (Denmark BEK 1484/2024⁹⁷).

⚠️ Federal tax tests

For a private activity bond, the average maturity cannot exceed *“120 percent of the average reasonably expected economic life of the facilities being financed”* (26 USC 147⁷⁷). That test reaches qualified 501(c)(3) bonds and exempt facility bonds (26 USC 147⁷⁷). Federal arbitrage rules also treat it as abuse when an issuer gains an interest-rate advantage while *“allowing bonds to remain outstanding longer than is otherwise reasonably necessary”* (26 CFR 1.148-10¹¹⁵).

⚠️ Interest rate risk at each refunding

A refunding is priced at the rates of its day. For an advance refunding, GFOA suggests a breakeven analysis of *“how much interest rates can rise”* before waiting for a tax-exempt current refunding becomes the better choice (GFOA, Refunding Municipal Bonds¹¹⁰). **GAIERGY VIEW** A plan that needs a refunding in year 30 carries that rate risk for 30 years. A refunding also needs a call date, and some very long bonds have none: TVA's 2065 bonds are *“not subject to redemption prior to maturity”* (TVA 8-K 2015¹⁰¹).

⚠️ More total interest

ILLUSTRATIVE In the example above, total interest rises from \$7.3 million at 30 years to \$16.5 million at 60 years. **GAIERGY VIEW** Very long bonds may also price higher, or be taxable: the DC Water century bond was a taxable bond (DC Water, 2014-07-10⁶⁷).

GAIERGY VIEW: WHAT IT MEANS FOR A TEN

- **Match the term to the part.** Pipe and wells can carry the longest debt. Heat pumps, pumps and controls wear out sooner and fit shorter debt.
- **Name the bond type early.** The bond type sets the maturity test: a governmental bond, a qualified 501(c)(3) bond or an exempt facility bond. Bond counsel can confirm it.
- **Check the state useful-life table.** New York lists no class named for a TEN; the closest, hot water heating, stops at 30 years (NY Local Finance Law 11.00¹¹³). A state could consider a 40 to 50 year class for TEN pipe and wells, in line with water systems.
- **Plan the refundings on day one.** Set call dates, keep reserves, and budget for a higher rate at each refunding.
- **Use the lower charge to win connections.** Every building that joins spreads the same debt over more payers.

SECTION 8

Match the model to the site

What this section shows: four common site types and the ownership model that fits each. This section is **GAIERGY VIEW** except where a source is shown.

Which model fits your site?

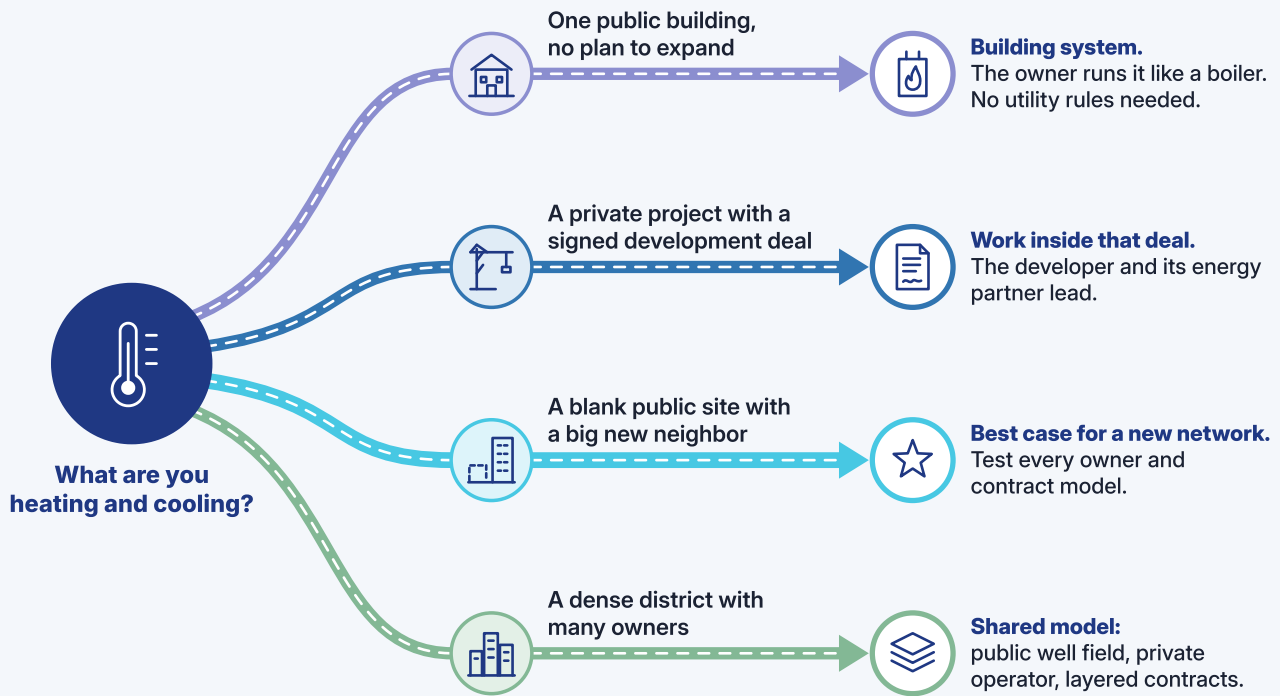


Figure 16. Start with the site, not the owner. Four site types lead to four different models. Gaiergy graphic.

Case 1. One public building, no plan to expand

Wells and heat pumps for one public building are a building system, not a utility (Figure 8, Section 5). There are no outside customers, no tariff and no billing. The owner runs it like a boiler or a chiller. A city that owns both the ground loop and the heat pumps can claim the s.48 credit by direct pay, if the project is under 1 MW or meets domestic content (Section 6) (26 USC 6417⁷⁹; Treasury T.D. 10015²; 26 USC 45³).

If the plan later grows to serve neighbors, the project becomes a network. That is a different governance problem. Gaiergy recommends that a city keep the two cases separate in its plans.

Case 2. A private project with a signed development deal

When a city has already signed a development deal, the developer and its energy partner lead. The city's role is to work inside that deal: permits, street access, and any incentives the deal allows. Whisper Valley in Austin shows a developer-led model at scale: the provider owns and runs four district systems for over 800 homes (EcoSmart¹⁶). A new public governance layer on top of a signed deal would need the developer's consent.

Case 3. A blank public site next to a large new anchor

This is the best chance to test every model. The land is public. The site has no design and no development team. A large, predictable anchor building nearby gives the network a core customer. Every owner type, contract and financing tool in this report is still open. The loop can go in the ground before the streets are built (Section 4).



Figure 17. Plan view of a generic site: an open public parcel with wells under its fields, next to a large new stadium-type anchor and a neighborhood grid. Gaiergy illustration; not a real place.

Case 4. A dense district with many owners

A dense downtown has many owners, old streets and often an existing district energy system. A shared model with layered contracts fits best. One option is a public well field and a private operator. Another is the final Troy structure: a public body leases the land, and one owner holds the whole network (National Grid, Troy Stage 2, 2025¹³). That owner holds the ground loop and heat pumps that the credit rules look for (Treasury T.D. 10015²). Gaiergy recommends that the team check the credit ownership rules and bond financing before it splits title between parties. If the project uses a 63-20 corporation, the government ends up owning the network at bond payoff. If a nonprofit is to keep it, a 501(c)(3) owner with qualified 501(c)(3) bonds fits better (Section 6).

City snapshots

What this section shows: how the three decisions look in Baltimore, New York City and Boston, from public sources as of 2026-09-30. Each snapshot ends with a short Gaiergy view.

Baltimore, Maryland

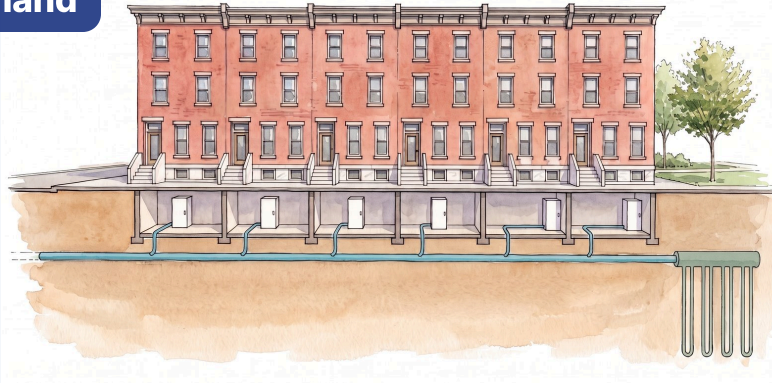


Figure 18. Rowhouses, each with a basement heat pump, sharing one pipe below ground and a small well field at the end of the block. Gaiergy illustration.



STATE LAW

- WARMTH Act (2024): gas companies with 75,000+ customers file 1 to 2 pilots (Maryland ch. 564 (2024)³⁷; Maryland SB 570 fiscal note³⁸)
- 80%+ low or moderate income; cities, counties, community groups may nominate neighborhoods (Maryland ch. 564 (2024)³⁷; Maryland SB 570 fiscal note³⁸)
- Brookings 2003: Dillon's Rule state (Brookings 2003²⁵)



WHO CAN OWN

- Electric, gas or water companies
- No city ownership path (Maryland SB 570 fiscal note³⁸)



PILOTS AND STATUS

- Dec 2025: PSC did not approve the pilots; costs *"not only exorbitant, but also speculative"*; plans to hire a consultant (Maryland Matters 2026²²) (PSC order **UNCONFIRMED**)
- Reported costs: BGE Columbia about \$54.1M; BGE Baltimore about \$43.5M; Washington Gas \$40M to \$50M (Maryland Matters 2026²²)
- Pilots *"remain stalled"* (Earthjustice 2026¹¹⁶)
- BGE candidate sites: Coppin State University, St. Stephens Court Apartments (BGE letter 2025¹¹⁷)



CITY AND STATE PROJECTS

- MCEC and City: \$121M pipeline, incl. Harborplace (ICLEI USA and MCEC 2026⁹¹)
- *"key decisions on ownership, technology, and revenue are in progress"* (ICLEI USA and MCEC 2026⁹¹)
- Police stations, Sun Building: city ownership with direct pay; *"still undergoing feasibility assessments"* (ICLEI USA and MCEC 2026⁹¹)

EXISTING DISTRICT ENERGY

- Vicinity Baltimore: 28 miles of pipe, 193 buildings (Vicinity Baltimore¹¹⁸)
- Maryland steam heating companies left PSC jurisdiction in 1999 (DLS fiscal note, HB 126 (1999)¹¹⁹)



FINANCING ENTITIES

- MEDCO (created 1984) (Maryland DLS 2026⁸²)
- MCEC (state instrumentality) (Maryland Manual, MCEC⁸³)
- BDC (501(c)(3), exempt since 1992) (ProPublica, BDC⁸⁸)



LARGE NEW ANCHOR

- Pimlico: Maryland Stadium Authority leads the rebuild (Maryland Stadium Authority¹²⁰)
- Preakness expected back in 2027; permanent clubhouse projected for the 2028 race (Maryland Stadium Authority¹²⁰)

WHAT COULD BE DONE (GAIERGY VIEW)

- The city-owned single-building projects fit Case 1 (Section 8). They can move as building systems, with direct pay if they are under 1 MW or meet domestic content.
- Harborplace is a dense, multi-owner district next to an existing district energy system. It fits Case 4: a shared model with layered contracts.
- A blank-slate public site near the state-funded Pimlico rebuild is the kind of site where every model can be tested (Case 3). This is a Gaiergy idea only. No public source says geothermal is planned at Pimlico.
- Because the WARMTH Act has no city ownership path, a city-owned network that serves several customers may need new state authority. Gaiergy recommends that the City confirm this with counsel before it plans city ownership beyond single buildings.

New York City

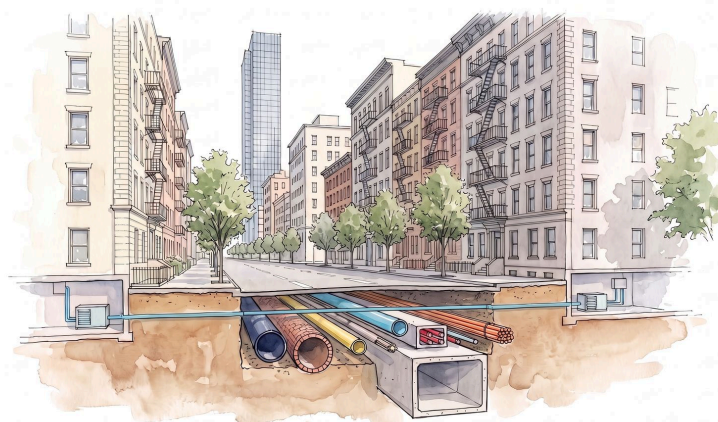


Figure 19. A dense street section: the network main fits among water, sewer, gas, power, telecom and the subway. Gaiergy illustration.



STATE LAW

- UTENJA (2022): 7 largest utilities propose 1 to 5 pilots; PSC regulates (NY UTENJA 2022³¹; NY S9422 text²⁰)
- Brookings 2003: Dillon's Rule state, Article IX caveat (Brookings 2003²⁵)



WHO CAN OWN

- Utilities
- A non-utility that owns a TEN serving multiple customers across property lines: generally a utility
- PSC declined to exempt municipal-owned TENs as a class, though New York City asked (NY PSC order, Case 22-M-0429⁵)



PILOTS AND STATUS

- Con Edison, all Stage 2: Chelsea \$95.5M; Rockefeller Center \$128.2M; Mount Vernon (Westchester) \$191.7M (Con Edison UTEN report, Aug 2026¹²¹)
- National Grid: Brooklyn NYCHA campus, \$125.4M, Stage 2 (National Grid UTENJA report, Aug 2026¹²²)
- 3 pilots inside New York City: about \$349M in forecast budgets, a Gaiergy sum **GAIERGY VIEW** (Con Edison UTEN report, Aug 2026¹²¹; National Grid UTENJA report, Aug 2026¹²²)
- **GAIERGY VIEW** No Stage 3 construction order found in a Gaiergy docket search



CITY ACTION

- NYCEDC RFEI *"Thermal Energy Network Financing, Development, Ownership & Operations"*: Hunts Point and Sunset Park; published 2026-03-10, due 2026-06-09 (NYC City Record 2026¹²³)
- Local Law 97: most buildings over 25,000 sq ft; limits from 2024, stricter in 2030, net zero goal by 2050 (NYC LL97¹²⁴)



EXISTING DISTRICT ENERGY

- Con Edison: largest district energy steam system in the US (Con Edison⁵⁴)
- Approximately 105 miles of steam pipe across their service territory and more than 1,500 buildings (Con Edison 2022⁵⁵; Con Edison⁵⁴)



FINANCING ENTITIES

- NYPA (NY PAL s.1002¹⁰); TEN ownership authority **UNCONFIRMED**
- DASNY (DASNY FY2025-26⁸⁴)
- NYCEDC describes itself as *"a mission-driven, nonprofit organization"* (NYCEDC 2026⁸⁹)
- Build NYC Resource Corporation: helps *"501(c)(3) organizations and other exempt facilities"* access *"low-cost debt through tax-exempt bond financing"* (Build NYC⁸⁵)
- NY Green Bank (NY Green Bank⁹⁰)

WHAT COULD BE DONE (GAIERGY VIEW)

- The PSC position means a city-owned network that serves several owners may still face PSC review. The RFEI answers will show what structures the market offers.
- Local Law 97 gives large buildings a reason to connect. That lowers the risk that too few buildings sign up, compared with other cities.
- New York has many conduit issuers. The financing question is less *"who can issue"* and more *"who owns the loop and the heat pumps for the tax credit."*

Boston, Massachusetts

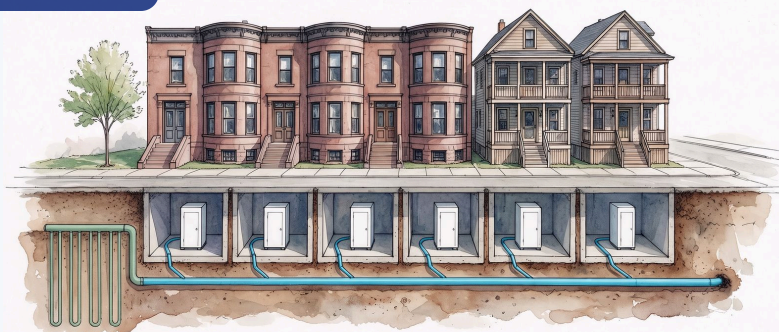


Figure 20. Brownstones and triple-deckers served by one main below ground and a small well field. The main can extend street by street. Gaiergy illustration.



STATE LAW

- 2021 ch. 8: DPU may approve gas company thermal pilots
- 2022 ch. 179: GSEP may fund thermal
- 2024 ch. 239: *"A gas company may make, sell or distribute utility-scale non-emitting thermal energy, including networked geothermal"* (Mass. Acts 2021 ch. 8²⁸; Mass. Acts 2022 ch. 179²⁹; Mass. Acts 2024 ch. 239³⁰)
- Brookings 2003: not a Dillon's Rule state (Brookings 2003²⁵)



WHO CAN OWN

- Gas companies
- No city ownership provision found: **UNCONFIRMED** that none exists (Mass. Acts 2024 ch. 239³⁰)



PILOTS AND STATUS

- Eversource Framingham: launched 2024; about 1 mile of main, 90 boreholes, 36 buildings, 135 accounts (Eversource¹⁵; Canary Media 2025²¹)
- National Grid Lowell: canceled December 2024 over cost (WBUR 2025²³)
- National Grid Franklin Field (Dorchester), with the Boston Housing Authority: 7 buildings, 129 families, in design (Boston Housing Authority 2024¹²⁵; National Grid geothermal hub¹²⁶)



CITY ACTION

- BosTEN: MassCEC and the City fund the Boston Green Ribbon Commission to lead a study (MassCEC BosTEN¹²⁷)
- Harbor, river and bedrock heat sources (MassCEC BosTEN¹²⁷)



EXISTING DISTRICT ENERGY

- Vicinity Boston: about 10 miles of pipe, 51 buildings in Boston (Vicinity Boston¹²⁸)
- 42 MW electric boiler installed; engineering complete for a 35 MW heat pump complex (Vicinity Boston¹²⁸)



FINANCING ENTITIES

- MassDevelopment (G.L. c.23G) (Mass. G.L. c.23G s.2⁸⁶)
- MassCEC (G.L. c.23J) (Mass. G.L. c.23J s.2⁸⁷)
- DOE Framingham award: \$8.6M (Canary Media 2025²¹)

WHAT COULD BE DONE (GAIERGY VIEW)

- Framingham gives real operating data on cost and performance. It is the best local evidence for any Boston plan.
- Home rule gives Boston more room than Baltimore or New York City, but no state law names city-owned TENs. Gaiergy recommends that the City confirm its authority before it plans to own a network.
- The existing district energy owner is electrifying. It is a possible partner for a downtown network, and a possible competitor.

A checklist for a city or state

What this section shows: 15 yes or no questions to answer before choosing an owner. A "no" is not a stop. It shows where work is needed. The checklist is [GAIERGY VIEW](#).

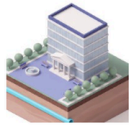
☐ Tick yes or no at each gate Checklist and phases: [GAIERGY VIEW](#)



LAW AND AUTHORITY

Gates 1 to 3





MONEY

Gates 9 to 13

9

- ☐ **Tax-exempt bonds: is the credit cut of up to 15% in the model?**

The cut changes the value of the credit

10

- ☐ **Direct pay: under 1 MW, or meets domestic content?**

Otherwise the credit may be reduced or lost (Section 6)

11

- ☐ **Has bond counsel tested private business use?**

Serving private buildings can make the bonds private activity bonds

12

- ☐ **Each financing entity named by what it is in law?**

63-20, 501(c)(3) and conduit issuer are different tools

13

- ☐ **63-20 corporation: does the long-term plan put title with the government?**

Title passes to the government when the debt is retired; to keep a nonprofit owner, look at a 501(c)(3) owner with qualified 501(c)(3) bonds (Section 6)

CUSTOMERS AND OPERATIONS

Gates 14 to 15



Ready to choose an owner

15

- ☐ **A qualified operator under contract for the life of the bonds, and a project that works with no federal grant?**

Wells, heat pumps and billing are new skills for most cities; federal pilot lists have shrunk

14

- ☐ **Each customer group: who pays if heat use goes up, who loses if it goes down?**

The key risk split between contracts (Section 5)

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