



## **ZEVAC® Regulatory Cost Recovery: Investing in Technology to Reduce GHG Emissions**

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Chad Murray, CEO, ZEVAC

*Including ZEVAC cost recovery in rate cases provides funding to improve safety and reduce greenhouse gas emissions from pipeline replacement projects and routine pipeline operations and maintenance activities. Preventing toxic gases and liquids from being emitted into the atmosphere benefits local communities and the global environment.*

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## Rate case recovery methods

Utilities use ZEVAC equipment to improve safety, lower operating costs, and reduce greenhouse gas emissions. Utility providers can recover the capital or operations and maintenance expense for the purchase of ZEVAC (Zero Emission Vacuum And Compressor) technology in many ways. The cost recovery method depends on how and why the utility is using ZEVAC equipment and the different cost recovery mechanisms in use in any particular jurisdiction. Recovering ZEVAC purchase investments generally happens through the following methods:

- 1) *Capital rate-based recovery*: Utilities can recover the cost as part of a capital project or capital program. For example, a line upgrade could be a multiyear, multimillion-dollar project within the rate base, and ZEVAC equipment purchased as part of that project is billed to the project and recovered as an addition to the rate base in a rate case or through tracker recovery.
- 2) *Research and development pilots or compliance programs*: Some utilities recover the cost through specific programs or pilots approved by their state commissions. For example, California requires the use of ZEVAC equipment in certain operations, and as a result, utilities report on and recover the cost as part of annual or biannual compliance or pilot program filings. Utilities can also choose to pilot ZEVAC equipment to evaluate the benefits and cost-effectiveness through a research and development pilot, and those costs can be recovered via cost-recovery mechanisms such as trackers that are put in place upon approval of the pilot program. Some pilot programs approved for recovery have included the cost of full-time-equivalent employees (FTEs) to optimize the use of ZEVAC equipment as a best practice in all applicable operations.
- 3) *Operations and maintenance (O&M) expense*: Utilities that choose to have their contractor network deploy ZEVAC equipment can recover those costs as an O&M expense.
- 4) *Grant funding*: Grants are funding opportunities because deploying ZEVAC equipment results in measurable GHG reductions. On some states, grant funding the utility receives offsets the recovery of any of the rate case, tracker, or O&M mechanisms listed above. When the grant is for research and development, the rate case may not be impacted.

Clean BC is a British Columbia government program that has offered grants to support ZEVAC investments that lower emissions. Canadian utilities have also received rebates for their ZEVAC equipment investments.

ZEVAC performance advisors are available to support utility teams with the information required for rate case development.

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## Rationale for ZEVAC investments

The list below captures some of the value drivers that regulators may consider as the direct and indirect benefits of ZEVAC technology:

- The volume of gas captured (not emitted) by ZEVAC equipment.
- The dollar value of gas not emitted or the LAUF volume reduced.
- Reduced risk (frequency of occurrence × potential dollar liability) of injuries, fatalities, health issues, or critical emergencies that result from flaring, venting, or other operations that occur without ZEVAC equipment.
- Lower total cost of operations because
  - No inlet gas conditioning is required,
  - Compliance increases, while issues leading to downtime, fines, and shutdowns are reduced, and
  - Work notification, administration complaint handling, and field response labor costs to respond to complaints are all much less because ZEVAC equipment is quiet, compact and portable.
- Environmental stewardship is enhanced by an increase in social value (the monetary value of the future reduction in damage by not emitting a metric ton of methane), the reduction in Scope 1 emissions, and the public relations value from press releases that communicate progress towards net zero goals. The volume not emitted times the dollar social value per metric ton of methane not emitted establishes this intangible value that is relevant for ESG discussions and documentation.
- If appropriate, lower personnel, insurance, and legal costs since ZEVAC utilization will likely reduce accidents and fines related to flaring and venting.

For more information, contact ZEVAC to obtain a ZEVAC EVA Microsoft Excel calculator. The calculator allows various value scenarios to be modeled based on estimated volumes and the number of blowdown or other operations that occur over a five-year period.

Utilities that have included ZEVAC equipment in their rate cases as of December 2022 include:

- Con Ed of NY
- Dominion Energy
- FortisBC Energy Inc.
- PG&E
- San Diego Gas & Electric
- SoCal
- VNG (Southern Companies)

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## Technical information

ZEVAC (Zero Emission Vacuum And Compressor) equipment reduces risk by preventing natural gas and liquids from being released into the atmosphere, ultimately eliminating the need for venting and flaring during line replacements and a wide variety of O&M activities. The pneumatically driven technology transfers gas or liquid products from one pressurized system to another. Once the pipeline section is de-pressurized, ZEVAC units safely, reliably, and affordably transfer products back into a downstream or adjacent pipeline or into a containment vessel instead of venting to the atmosphere.

Utility field service crews or ZEVAC Service Network certified contractors can quickly and easily deploy ZEVAC equipment to enhance performance in operations in pipes ranging from 2 inches to 48 inches outside diameter.

- ZEVAC units are small, portable, quiet, and uniquely capable of compressing 100 percent gas to 100 percent liquid and everything in between. The ability to handle liquids is a significant enhancement over traditional cross-compression equipment that would suffer a catastrophic failure when liquids are present during operation.
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- Since natural gas and liquids are not released into the atmosphere, the risk of ignition that could lead to serious property damage, injuries, or fatalities is reduced.
  - Being 100 percent mechanical with no onboard electronics, ZEVAC equipment is Class I, Division 1 compliant, which makes it safer for live gas operations where ignition could be catastrophic.
  - With less flaring and venting, Scope 1 emissions are cut, and the risk of fines, downtime, and negative publicity is reduced.
  - ZEVAC units in daily operation by end-users have delivered millions of failure- and incident-free operating hours. Due to this high reliability, ZEVAC customers believe the technology is proven to reduce risk and lower the total cost of operations better than competing technologies.
  - Certified ZEVAC training programs and operational qualification (OQ) guidelines standardize safe and efficient operations and address abnormal

operating conditions to exceed traditional cross-compression safety standards.

Five models of ZEVAC equipment are being used by utilities for stationary or mobile applications. Contact a ZEVAC performance advisor for current options and pricing.

| Model         | Gas pressure range | Usual deployment     | Typical work   |
|---------------|--------------------|----------------------|--|
| ZEVAC Quad    | 0 - 1480 psi       | Trailer or fixed     | Whole pipe drawdowns   |
| ZEVAC Twin LP | 0 - 600 psi        | Truck bed or trailer | Planned work, pigging, pipeline and distribution main replacements, etc. |
| ZEVAC Twin HP | 0 - 1480 psi       |                      |  |
| ZEVAC Mini    | 0 - 150 psi        | Onboard crew truck   | Meters, main replacements & service lines, etc.                          |
| ZEVAC Mini HP | 0 - 1480 psi       |                      |  |

## Applications summary

The chart below highlights typical pressures, pipe diameters, lengths, equipment models, and recovery times for transmission and storage and downstream distribution applications. This information is for illustrative purposes only. Contact a ZEVAC representative for more specific application information.

| ZEVAC Application Description                   | Midstream Transmission & Storage | Downstream Distribution | Typical Pressure    | Typical Pipe Dia x Length      | Minimum Equipment Model | Typical Duration to 95% Recovery | Amount of Gas Recovered (scf) |
|---|----------------------------------|-------------------------|---------------------|--------------------------------|-------------------------|----------------------------------|-------------------------------|
| Main replacement projects                       | —                                | ✓                       | 55 psig             | 12 in. x 2000 ft               | Twin                    | 2.5 hr                           | 6,100                         |
| Commissioning new lines                         | —                                | ✓                       | Vacuum              | 4 in. x 500 ft                 | Mini                    | 1 hr                             |                               |
| Meter and regulator (M&R) maintenance           | —                                | ✓                       | 55 psig             | 4 in. x 50 ft                  | Mini                    | 5 min                            | 15                            |
| Odorization systems                             | —                                | ✓                       | 55 psig             | 500 gallon                     | Mini                    | 15 min                           |                               |
| Main repairs                                    | —                                | ✓                       | 55 psig             | 4 in. x 500 ft                 | Mini                    | 10 min                           | 150                           |
| Power plants                                    | ✓                                | —                       | 1200 psig           | 20 in. x 1000 ft               | Quad                    | 12 hr                            | 165,000                       |
| Compressor stations (whole station)             | ✓                                | —                       | 1200 psig           | 20 in. x 1000 ft               | Quad                    | 12 hr                            | 165,000                       |
| Compressor units                                | ✓                                | —                       | 1200 psig           | 20 in. x 100 ft                | Quad                    | 1 hr                             | 16,500                        |
| Integrity management – pigging                  | ✓                                | —                       | 1200 psig           | 20 in. x 20 ft                 | Twin / Quad             | 30 min                           | 3,300                         |
| Integrity management: Stopple repairs & cutouts | ✓                                | ✓                       | 1200 psig           | 20 in. x 500 ft                | Quad                    | 6 hr                             | 82,500                        |
| Double block & bleed; double block & recycle    | ✓                                | ✓                       | 55 psig / 1200 psig | Valve body                     | Mini HP                 | Continuous operation             |                               |
| Valve replacement                               | ✓                                | ✓                       | 55 psig / 1200 psig | Refer to App #10 or #13        | Quad                    | Refer to App #10 or #13          |                               |
| Whole-line blowdowns                            | ✓                                | ✓                       | 55 psig / 1200 psig | All pipe sizes, 1 - 10 miles   | Quad(s)                 | 1/2 day - Multiple days          |                               |
| ZEVAC vs flaring                                | ✓                                | —                       | 1200 psig           | All pipe sizes, 1 - 10 miles   | Quad(s)                 | 1/2 day - Multiple days          |                               |
| ZEVAC vs thermal oxidizers                      | ✓                                | —                       | 1200 psig           | All pipe sizes, 1 - 10 miles   | Quad(s)                 | 1/2 day - Multiple days          |                               |
| Meters, regulators, and custody transfer        | ✓                                | —                       | 1200 psig           | 8 in. x 50 ft                  | Mini HP / Twin          | 30 min                           | 1,500                         |
| Butane & propane systems (all liquids & vapors) | —                                | ✓                       | 175 psig            | 144 in. x 100 ft (bullet tank) | Twin                    | 36 hr                            |                               |
| Butane & propane systems (liquids only)         | —                                | ✓                       | 175 psig            | 144 in. x 100 ft (bullet tank) | Twin                    | 6 hr                             |                               |
| NGLs  | ✓                                | —                       | 1000 psig           | 8 in. x 1000 ft                | Quad                    | 4 hr                             | 25,600                        |
| Hydrogen production & storage facilities        | —                                | ✓                       | N/A                 | N/A                            | N/A                     | N/A                              |                               |
| Hydrogen blending skids                         | —                                | ✓                       | N/A                 | N/A                            | N/A                     | N/A                              |                               |

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## Training, certification and implementation support

ZEVAC provides onsite training and technical support to utility field service crews and the contractors that support them. Classroom and online training programs, safety policies, and standard work instructions are available to ensure successful implementation with a fast payback.

The ZEVAC team of performance advisors also offers enterprise-wide technology adoption, planning, and roll-out tools, including:



- Networking meetings that offer a deep-dive technical and economic value analysis discussion for a small group of managers, engineers, and representatives from HSE and supply chain, logistics or procurement.
- Value chain labs for challenging projects or large implementations, a full-day value chain lab is recommended. "Value chain" implies bringing together utility and ZEVAC stakeholders that can solve difficult issues. Four participants from each side are recommended. "Lab" implies an opportunity for analysis, brainstorming solutions, and identifying ways to test and pilot new solutions.
- Crawl-walk-run processes that align the utility and ZEVAC with easily understood steps towards the changes required to adopt new ways of working – Crawl (immediate changes that an organization can easily execute, i.e., a pilot), Walk (near-time changes that an organization can execute once processes are streamlined or early ideas are tested), and Run (long-term changes that can be executed and rolled out on a wider basis by proven ZEVAC technology.)
- A key performance indicator, pre-, and post-project scorecard, to ensure the technology is adopted more widely, and to document the value of ZEVAC applications.

For more information, contact ZEVAC, a technology company that pioneered the only cross-compression equipment capable of recovering any mix of gas or liquids in pipes to eliminate flaring and venting. The reliability of the proven and patented ZEVAC equipment to mitigate methane emissions has been established by its incident-free performance track record with asset owners and the service contractors supporting them.

[www.GetZEVAC.com](http://www.GetZEVAC.com)

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