

Tenaska Business Challenge

Commonwealth City Gas Works

Spring 2026

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¹See Glossary

Background:

Commonwealth City Gas Works (CCGW) serves the citizens of Commonwealth City, Massachusetts with Natural Gas. Commonwealth City has 50,000 residents and some industrial activity that increases annual fuel consumption required within the CCGW service area. For fuel planning purposes, CCGW, relies on a metric called Residential Consumer Equivalents (“RCEs”). An RCE is equal to roughly one household. Commonwealth City has 60,000 RCEs.

Last winter during Winter Storm X, CCGW’s fuel sourcing plan fell short of its goal of delivering reliable and affordable fuel supply. The extreme cold weather during Winter Storm X caused CCGW’s service area to consume more fuel than anticipated, which required CCGW to purchase its fuel in real time on the open market. Meteorologists have coined Winter Storm X, “A Fifty Year Storm”, estimating the odds of a similar storm occurring at 2% per annum. Many surrounding areas suffered from a similar dynamic, also needing to procure supply at a moment’s notice. The supply / demand mismatch during Winter Storm X caused daily fuel prices to soar ~1,000% higher than normal. Winter Storm X lasted from January 20-23. Over these four days, CCGW had to purchase \$173M of spot market fuel in excess above CCGW’s original winter supply plan. Governor Thomas deemed Winter Storm X a Weather Emergency and immediately provided CCGW with a \$200M, 0% interest rate loan from the State Treasury to cover this unforeseen cost. The 0% loan is due 10/31/26. Governor Thomas arranged this funding to provide CCGW enough time to secure a longer-term financing solution via the capital markets to pay for Winter Storm X’s surprise elevated costs and develop a marketing strategy to rebuild public trust and convince citizens that CCGW’s go-forward plan is the optimal path forward in terms of reliability and affordability.

CCGW has assembled a team of analysts to help them prepare for next winter and develop a plan going forward.

¹See Glossary

Introduction of Deliverables:

You and your team have been asked to prepare a presentation for the CCGW Board of Directors. You will have a maximum of 12 minutes to present 3 plans (Fuel, Finance, and Marketing). Following the presentation, the board has allotted 8 minutes for questions to the presenters. You are expected to justify your plan with data, risk analysis, and customer impact. Include rationale for your choices and how your plan addresses public concerns. Refer to the scoring rubric for specific breakdowns, but keep in mind that the board expects a well-balanced plan, and it will be considered as a whole package.

Fuel Plan

Use the provided Fuel Supply Model to design a winter fuel sourcing strategy that balances cost and reliability. Consider pipeline constraints¹, capacity types, and historical performance. While this Fuel Supply plan is only for next Winter, presumably CCGW will continue to follow the analyst's prescribed plan indefinitely. Your findings need to be a part of the presentation, and the model should be available for review/audit by the Board.

Finance Plan

Choose a financing strategy to repay the \$200M emergency loan. Options include extending the 0% loan or using Municipal Bonds. Each has trade-offs in cost, risk, and public perception.

Marketing Plan

A high-level marketing strategy (included in your board presentation) that persuasively communicates CCGW's plan. You are also expected to include a sample communication that will be sent to customers. It should reassure the public and stakeholders that the proposed Fuel Plan and Finance Plan are well thought out and, in the community's (and CCGW's) best interest.

¹See Glossary

Fuel Plan Overview

To ensure reliable and affordable fuel supply for Commonwealth City during Winter 2026/2027, CCGW must strategically source natural gas from four available pipelines. Each pipeline offers different levels of reliability, cost, and contractual terms. The Fuel Supply Model helps evaluate different sourcing combinations to optimize cost and reliability. Given the variability of temperatures for any given Winter, there is no fixed or stable amount of gas needed by CCGW. We fully assume that all 4 pipelines will be utilized in the plan, it is up to each team to find the optimal combination.

How Pipeline Capacity Works

Natural gas pipelines operate on a reservation system. To flow gas, CCGW must contractually reserve space in advance—paying a Reservation Rate¹, a fixed fee paid regardless of actual usage. Reserving capacity gives CCGW the right, but not the obligation, to flow gas up to the reserved amount.

When gas is actually flowed, CCGW incurs costs based on the type of capacity reserved. These costs vary depending on the reliability and priority of the service.

Each day, CCGW submits a daily nomination to the pipeline indicating how much gas it intends to flow. If total nominations exceed available capacity, the pipeline will cut or reduce flows based on the level of service reserved. Higher-reliability contracts are prioritized, while lower-tier services may be reduced or denied.

This scenario has 2 types of capacity:

Firm Transport (FT)¹

- Guarantees delivery of the reserved amount, except in rare cases of Force Majeure¹ (e.g., natural disasters).
- Comes with a monthly reservation¹ fee and high reliability.
- If service is interrupted, customers are typically eligible for refunds.
- Ideal for securing base load supply during peak demand periods.

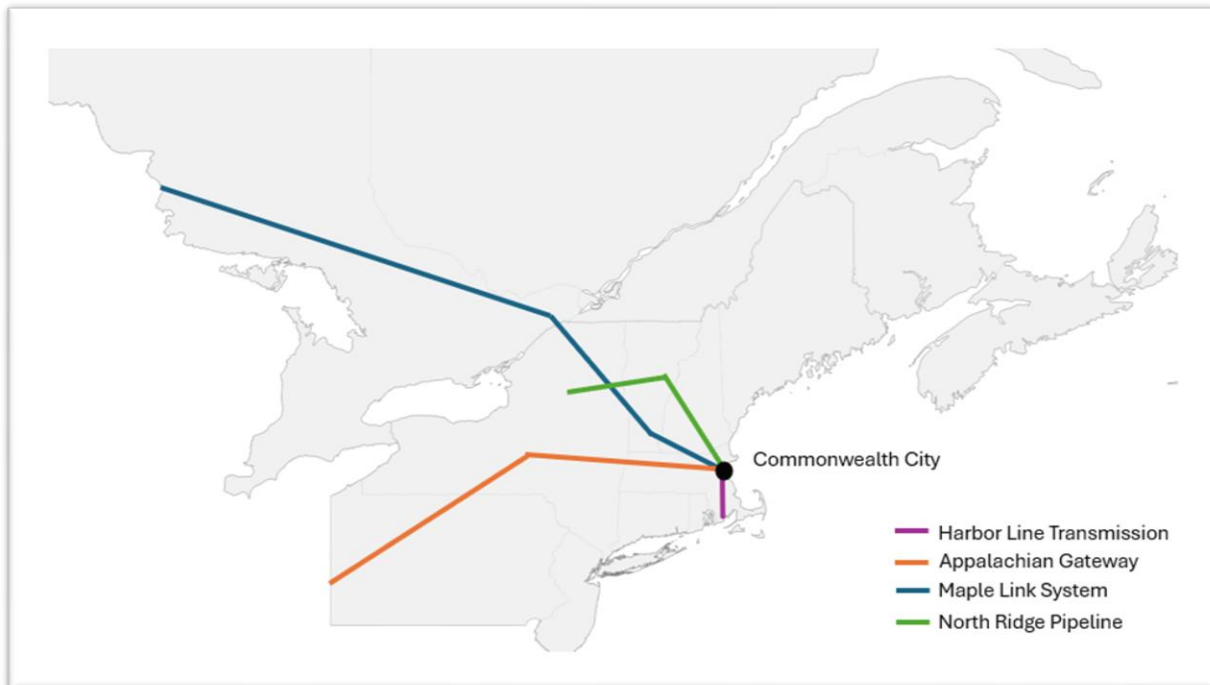
Interruptible Transport (IT)

- No guaranteed delivery.
- Customers pay only for gas that flows, with no reservation¹ fee.
- Service is provided only if capacity remains after firm customers are served.
- Least reliable, but most cost-effective.

¹See Glossary

Pipelines

- **Harbor line Transmission** (Firm Transport¹)
 - LNG¹ “Liquified Natural Gas”, reservation rate¹ embedded in purchase of gas.
 - Very Reliable, Very Expensive
 - Used to “Fill in the Gaps”
- **Maple Link System** (Firm Transport¹)
 - Reliable, moderately priced
 - Capacity sold Monthly
- **North Ridge Pipeline** (Firm Transport¹)
 - Very Reliable, higher priced
 - Capacity sold seasonally
- **Appalachian Gateway** (Interruptible Transport¹)
 - Least Expensive, Not Reliable
 - Capacity sold Seasonally



¹See Glossary

Fuel Plan Modeling Guidance

Inside of the Fuel Supply Model there is historical data for the past three Winters. The model uses this historical data to back test Winter Fuel Plans and provide average monthly customer cost and reliability score. Use this model to provide an optimal Fuel Supply Plan in terms of reliability and affordability.

Winter	Avg Monthly Cost
22/23	\$ 127.06
23/24	\$ 116.70
24/25	\$ 1,053.32
Post Relief	\$ 389.68

Historically, the average cost for a single RCE[†] has been \$145/month in the winter.

The two previous winters fuel planners were able to get monthly prices under the average, but last winter was grossly over. The State of Emergency Declaration and \$200M financing reduced the average cost to \$389.68/month per RCE[†] (a reduction of \$664/month per RCE[†], but still a tripling of cost from year prior).

After having established a Fuel Plan for next Winter, you will need to address the \$200M Emergency Funding payback via a Finance Plan, see next section for details.

You have been provided with the Fuel Supply Model that will assist in establishing your Fuel Plan proposal.

Your goal is to find an optimal combination of sources of supply. On the Model Worksheet tab, you may change the highlighted cells to find the optimal combination.

Your gas purchases are going to be constrained by what capacity is available on each pipe.

Available for Purchase	Nov	Dec	Jan	Feb	Mar
North Ridge Pipeline	25k/d				
Maple Link System	50k/d	40k/d	30k/d	30k/d	50k/d
Harbor Line Transmission	Only Pay on What you Flow up to 50K/d				
Appalachian Gateway	50k/d				

As you change your gas purchases you will notice your Capacity Purchase will automatically reflect changes.

[†]See Glossary

Historical Gas Plan

CCGW used the following plan for the past 3 years:

Gas Purchase	Nov	Dec	Jan	Feb	Mar
North Ridge Pipeline	10,000	20,000	20,000	20,000	5,000
Maple Link System	25,000	40,000	30,000	30,000	25,000
Harbor Line Transmission	See LNG Purchase Below				
Appalachian Gateway	50,000	50,000	50,000	50,000	50,000

LNG Purchase (Dth)	750,000
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A few considerations:

North Ridge Pipeline sells capacity by season not month, so the model will show your capacity purchase as the maximum monthly gas purchase.

Maple Link System sells monthly capacity but has varying amounts available to flow per month.

Harbor Line Transmission is the transport for LNG purchases, it is only pay for what you use, up to 50K/d. You buy LNG as a bulk amount to be used as needed throughout the winter. The LNG Option is use it or lose it. If you end the winter with excess LNG, you don't receive any credit for it.

Appalachian Gateway is interruptible¹ and subject to be reduced on the day. The purchase of this gas includes a put option, which allows you to sell back gas that doesn't flow at a \$0.10 discount from purchase price. For example, if you have bought 30,000 Dth/d at \$3.00/Dth and only 20,000 Dth are able to flow, you will sell back 10,000 Dth at \$2.90/Dth.

Reliability Score is a metric used to help assess the plan's supply integrity, it is also used for the Finance Plan.

Affordability Score is simplified example metric to assess affordability. You are encouraged to derive alternate metrics to evaluate affordability.

Imbalance occurs when you do not have the supply needed on the day. When this occurs, you are forced to buy gas from the pipe at an astronomical premium. Leaning on imbalance reduces reliability score and also adds considerably to fuel costs.

¹See Glossary

Finance Plan

CCGW has 2 financing options:

1. Pay It Back - Extend the 0% loan for an additional 12 months with a plan to repay the loan in its entirety by 10/31/27 via pass through charges of bills for rate payers for the next 12 months. Each RCE¹ will pay for their pro-rata share of the costs associated with this repayment strategy.

2. A Traditional Capital Markets Municipal Bond (“Muni”) – This financing varies depending on reliability standards of CCGW’s fuel plan ranked by a “Reliability Score”. Once the financing is secured, CCGW is not required to recertify their plan annually, only remain compliant with repayment terms of the financing. CCGW is able to secure the entire \$200MM Winter Storm X liability via Munis (or pay back the entirety or a portion of the liability during the next 12 months)

These are the 4 Muni Options:

- a. Reliability Score 99.01-100 = 20 year bond, 7% Annual Rate (Compounded Monthly), Amortized Monthly
- b. Reliability Score 97.01-99 = 15 year bond, 7% Annual Rate (Compounded Monthly), Amortized Monthly
- c. Reliability Score 95.01-97 = 10 year bond, 8% Annual Rate (Compounded Monthly), Amortized Monthly
- d. Reliability Score 0-95 = 5 year bond, 8% Annual Rate (Compounded Monthly), Amortized Monthly

Modeling Guidance: For the sake of modeling all financing options, assume a payback period equal to one year less than the terms of the associated bond to account for contingency within CCGW’s RCE¹ base. Some RCEs¹ may miss payments and it is important that CCGW is able to meet all bond payments. Any excess payments received (Total Bond Related Collections > Bond Payments) will be given back to the community in programs designated by the CCGW board at the end of the bond term. For modeling purposes, estimating an excess amount is unnecessary.

No contingency adjustment is necessary for any plan, partial or full, for payments designated under the “Pay It Back” category. The state has proven to work with PUCs in the past on a best-efforts basis.

¹See Glossary

Marketing Plan

CCGW must rebuild public trust and clearly communicate why its go-forward plan – including the chosen Fuel Plan and Finance Plan – is the optimal path for reliable, affordable service. As a formal case study task, you will develop a high-level communications strategy that complements your operational plans. This Marketing Plan should outline what messages will be delivered, to whom, how, and why, while allowing flexibility for you to propose creative tactics. Key considerations include:

- **Objective:** Reassure the public that CCGW has learned from Winter Storm X and is fully prepared to ensure reliability and affordability moving forward. The marketing strategy should convince customers and stakeholders that the chosen Fuel and Finance plans address past issues and benefit the community.
- **Target Audience:** Identify and segment the key groups that need to be reached. Focus on Commonwealth City residents (approximately 50,000 people) and industrial consumers within the CCGW service area. Each audience may have distinct concerns (e.g., household energy bills vs. operational continuity), so tailor your approach accordingly.
- **Key Messages:** Craft clear, positive messages that highlight the benefits and rationale of CCGW’s plan. Emphasize:
 - **Reliability & Preparedness:** Steps taken to prevent future fuel shortages and keep homes warm (e.g., new fuel sourcing strategy and infrastructure improvements).
 - **Affordability:** Measures to manage costs and minimize impact on customer bills (e.g., financing choices that spread or lower costs per household).
 - **Transparency & Accountability:** CCGW’s commitment to open communication about what happened during Winter Storm X and why the new plan is the best solution.
 - **Community Support:** How state support (like the 0% loan) and CCGW’s own initiatives work together to protect the community. Highlight any programs or safeguards (bill assistance, community investment of any excess funds) that show CCGW is putting customers first.
- **Communication Strategy:** Outline how you will deliver these messages to maximize reach and impact. Consider a consistent multi-channel approach. The messaging should address what happened, what is being done, and what it means for the public in simple terms.

- **Leverage Survey Data:** Use insights from the post-storm customer survey to inform your plan. The survey's demographic data and open feedback can reveal customer sentiment, common fears or misconceptions, and preferred communication channels.
- **Address Public Perception:** Be mindful of external factors such as negative press or social media discussions questioning the reliability of certain energy sources (e.g., renewable energy).
- **Stakeholder Engagement:** Before reaching the public, you must convince CCGW's Board of Directors that this Marketing Plan will be effective. In your board presentation (part of your overall Proposal), clearly link the communications strategy to the success of the Fuel and Finance Plans. Explain how each key message and outreach effort supports the business objectives (e.g., maintaining customer goodwill, ensuring timely cost recovery through customer bills). The plan should demonstrate a balance between business realism (paying back the loan, funding the chosen solution) and public empathy (understanding bill impact and trust issues).
- **Metrics for Success:** Define how CCGW will measure the effectiveness of the communications campaign. Establish high-level metrics such as improved public sentiment.

Glossary

Reservation rate – is the fixed fee charged by a pipeline company to a shipper for reserving a specific amount of pipeline capacity, regardless of whether the shipper actually uses that capacity.

Firm Transportation Contract – firm transportation contract, which guarantees the shipper access to the pipeline. The reservation rate is typically expressed in dollars per dekatherm per day (e.g. \$0.25/Dth/d). This fee ensures reliability and priority access, especially during peak demand periods.

Interruptible Transportation Contract – is a type of pipeline service where a shipper can transport natural gas without a guaranteed reservation of capacity. Unlike firm transportation, this service is subject to interruption, typically during periods of high demand or when firm capacity is fully utilized.

Liquefied Natural Gas (LNG) - LNG is natural gas that has been cooled to convert to a liquid state. This reduces its volume and makes it more efficient to store and transport. Generally, more expensive due to liquefaction costs, transportation, and reclassification.

Dekatherm (Dth) - A dekatherm is a unit of energy commonly used in the natural gas industry. Natural gas contracts, pricing, and billing often use dekatherms to reflect the actual energy delivered. Pipeline operators and utilities use dekatherms to track and charge for gas usage.

Residential Consumer Equivalents (RCEs) - is a standardized unit used in the energy industry to represent the typical annual consumption of a single-family residential customer. This helps utilities estimate demand, infrastructure needs and potential revenue.

Fuel Sourcing Plan – outlines the strategy and logistics for acquiring natural gas to meet operational, commercial, or regulatory needs. It ensures reliable, cost-effective, and compliant access to fuel for customers.

Pipeline Constraints – physical or operational limitations that restrict the flow of natural gas through the pipeline system.

- Capacity Limits: When demand exceeds the pipeline’s maximum throughput.
- Maintenance or Outages: Scheduled or unscheduled repairs that reduce flow.
- Compression Issues: Problems with compressor stations that maintain pressure and flow.

- Congestion: High demand in specific regions can lead to bottlenecks, especially during peak seasons (e.g. winter heating demand).

Force Majeure (FMJ) – refers to unforeseeable events or circumstances beyond a party’s control that prevent them from fulfilling contractual obligations. In the natural gas industry, it is a legal clause commonly found in supply, transportation, and service agreements.