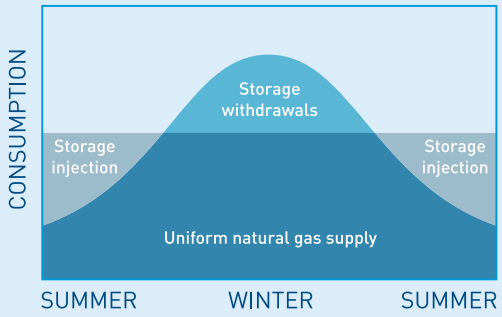
Load-balancing service

OVERVIEW

Load-balancing is the management of variations between summer and winter consumption. While there may be significant seasonal fluctuations in a customer's natural gas consumption, Énergir receives natural gas uniformly, i.e. the same quantity every day. Énergir therefore has to find a balance between the time it receives the gas and the time it is consumed by the customer.



Storage is a load-balancing tool. Natural gas is stored in summer, when consumption is lower, and withdrawn during winter, when customers' energy needs are greater.

COSTS OF LOAD-BALANCING SERVICE

Service Components

Natural gas is primarily stored in two ways:

1 Underground storage in a gaseous state:

- Union Gas at Dawn in southwestern Ontario (69,7 million cubic metres)
- Intragaz at Pointe-du-Lac, near Trois-Rivières (3,4 million cubic metres)
- Intragaz at Saint-Flavien, on the south shore of Québec City (18 million cubic metres)

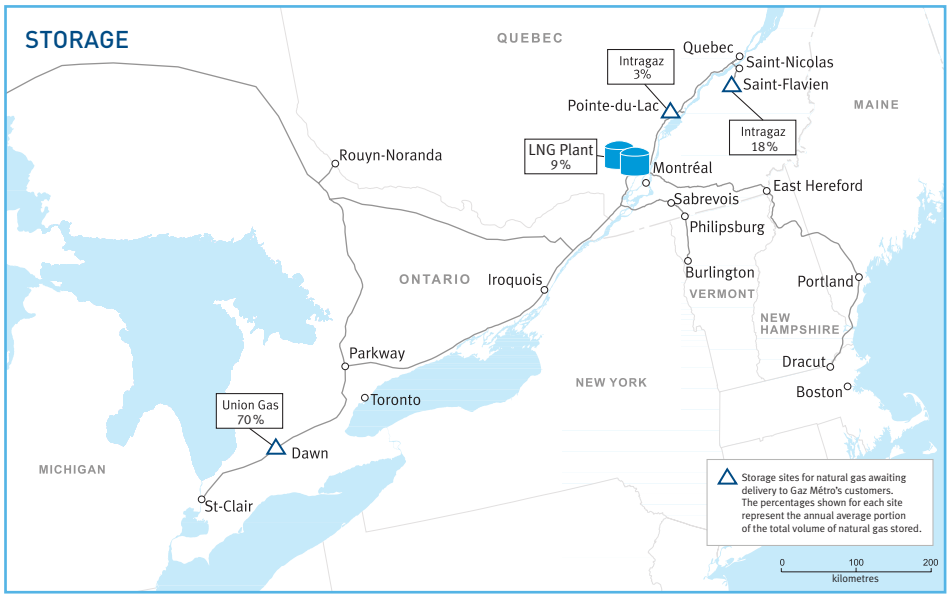
2 Storage in a liquid state:

- Énergir's liquefaction, storage and regasification plant (LSR Plant) in the Montreal area (8,8 million cubic metres).

Purchases at Dawn, along with the transportation capacities needed to route them to our territory, are also important load-balancing tools.

Regulated Rates

Storage in Ontario, as well as transportation between Dawn and our territory, are regulated by the Ontario Energy Commission and the National Energy Board. The storage sites in Québec, as well as the LSR plant, are regulated by the Régie de l'énergie.



Each year, Énergir evaluates its load-balancing tool needs. The costs of these tools and their impact on the price of the load-balancing service are then submitted to the Régie de l'énergie for approval.

Énergir bills load-balancing at the same price it pays its various suppliers for the tools, which means it makes no profit on this service.

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ÉNERGIR'S LOAD-BALANCING RATE

Peak and Space Tools

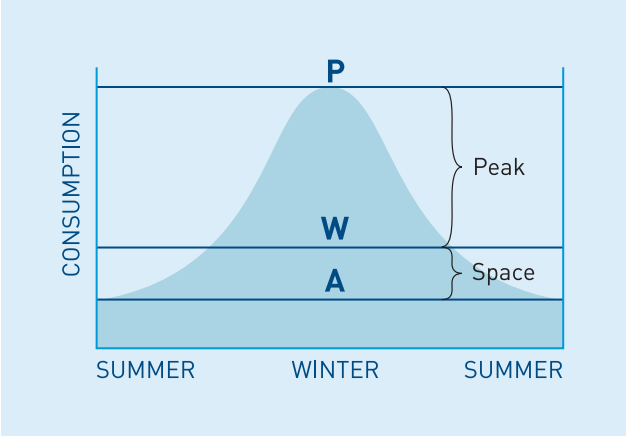
Énergir's load-balancing service consists of load-balancing tools costs, which are classified according to "peak" and "space" functions. What purpose do these two types of tools specifically serve?

- **Peak tools —** are used for **peak winter days.** Énergir's LSR plant is the main peak tool.
- **Space tools —** are used to serve **seasonal** winter volumes. Underground storage of natural gas during the summer for withdrawal in the winter is the main tool, as well as transportation tools.

Load-balancing Service Price

The peak and space tools are billed based on a customer's consumption patterns. Three consumption parameters — P, W and A, are calculated and used to determine the price:

- **P** is the daily **p**eak load;
- **W** is the **w**inter average daily load (November to March); and
- **A** is the **a**nnual average daily load.



The difference between the winter peak load and the average winter volume (**P** — **W**) corresponds to the use of peak tools, which will be billed at the price of those tools.

The difference between the average winter load and the annual average load (**W** — **A**) corresponds to the use of space tools, which will be billed at the price of those tools.

The calculation is as follows:

$$\text{Load-balancing price} = \frac{\text{Peak rate} \times (P - W) + \text{Space rate} \times (W - A)}{\text{Annual volume}}$$

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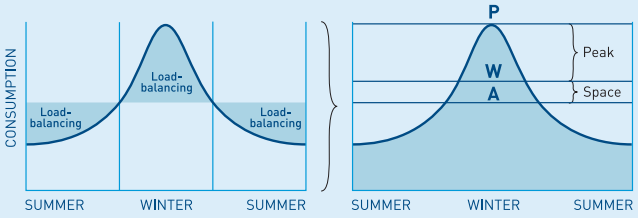
Impact of Consumption Profile on the Price

The price paid by customers reflects their consumption profile since it recognizes each customer's larger or smaller load-balancing needs — the bigger the differences between the parameters, the higher the load-balancing price, and vice versa.

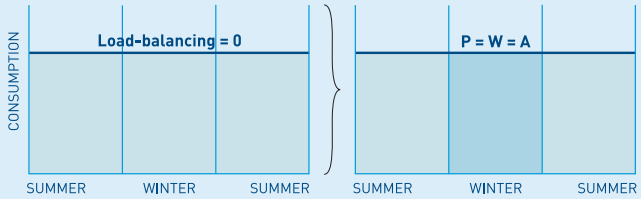
Profile of Heating Customers

The difference between the winter peak and the average winter load (**P** — **W**) and the difference between the average winter load and the annual average load (**W** — **A**) will be greater for heating customers whose consumption profile requires natural gas storage in the summer to supply volumes required in winter. Peak tools will also be necessary to supply peak winter consumption.



Profile of Stable Consumption Customers

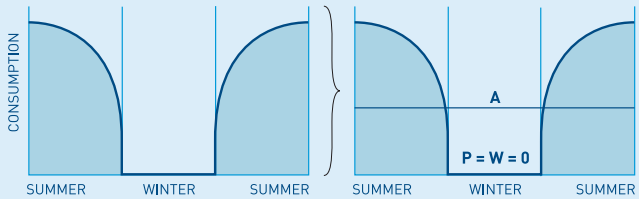
In contrast, no storage is required for customers who always consume the same volume, regardless of the season. There is therefore no difference between the parameters and no load-balancing charges are billed.



Other Consumption Profiles

What happens if a customer only consumes in summer? Not only does this type of profile not require any load-balancing, it also allows Énergir to reduce its overall load-balancing needs. The benefits are therefore passed on to the customer.

The **W** and **P** parameters are zero for this type of customer, which translates into a zero peak price and a credit price for space. The result will therefore be a credit for the load-balancing price.

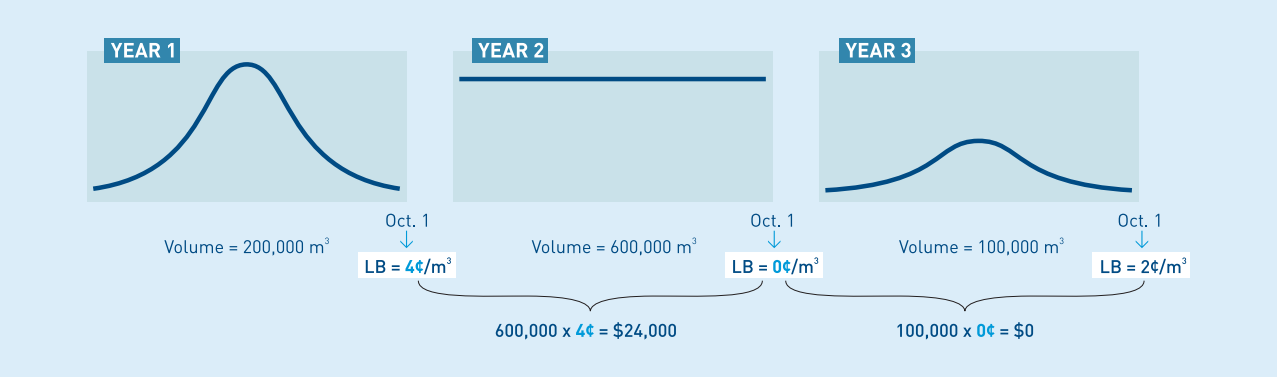


TimeLag between Volume Used for Calculation and its Application

We have seen that the load-balancing price varies according to different consumption profiles. This is also true for customers whose consumption profile changes from year to year.

The load-balancing price for customers is established on October 1 of each year, based on the preceding 12 months' consumption up to September 30. This price is then billed for the next 12 months. The example below helps visualize the impact of a change in consumption profile during a year on the price paid the following year.

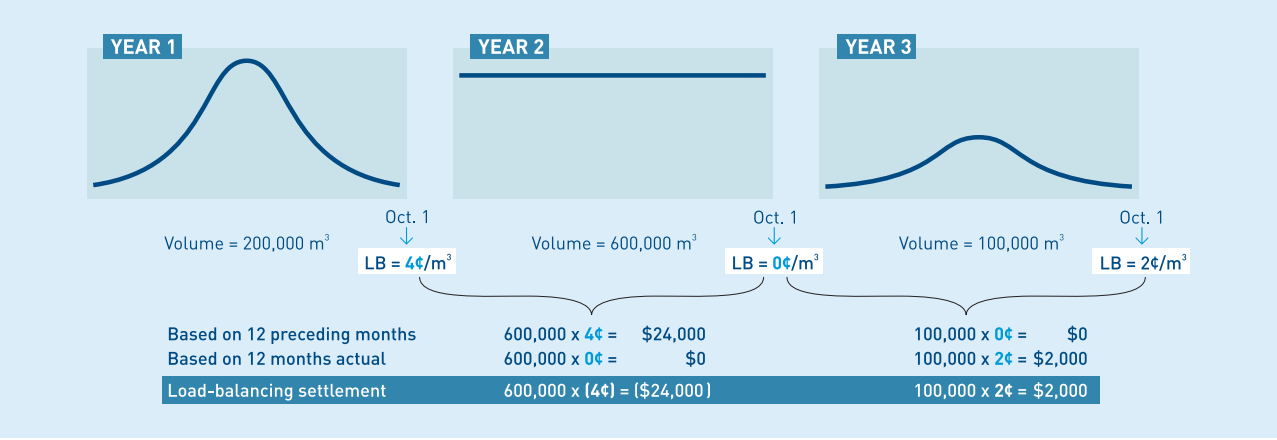
The example shows that the price calculated based on the heating profile for Year 1 will have an impact on the amount paid in Year 2 when volumes are much higher. Similarly, the beneficial impact of consumption stability in Year 2 will only be felt in Year 3, when the volumes are again lower.



Load-balancing Service Settlement

A customer with a consumption history of at least 12 months can choose a billing method for the load-balancing service that includes a service settlement as at September 30.

A second calculation is therefore made to determine what the load-balancing price would have been had it been calculated based on the current year's consumption (instead of the preceding 12 months). The difference between the two amounts is billed or credited to the customer at the end of the year.



Average Price

As the **A**, **W** and **P** parameters are based on the preceding 12 months' consumption, a customer who does not have a 12-month consumption history will be billed an average load-balancing price, which will differ depending on the customer's applicable distribution rate. The average price reflects the consumption pattern of all customers covered by each rate.

General Distribution Rate D_1 customers will also be billed an average price.

Impact of Delivery Profile and Volume Transposition

In addition to the consumption profile, the natural gas delivery profile also has an impact on the load-balancing service used by a customer.

For customers who use Énergir's natural gas supply service and who have a uniform delivery profile, the load-balancing service is simply based on the consumption profile.

However, in the case of customers who provide their own supply service, the load-balancing price will be based on their delivery profile.

Load-balancing rate making assumes a uniform gas supply throughout the year. Uniform delivery is simply equal to total deliveries divided by 365 days.

So, what happens if actual deliveries differ from uniform delivery? The impacts on load-balancing (LB) needs are summarized in the following table:

	WINTER	SUMMER
Delivery > Uniform delivery	LB↘	LB↗
Delivery = Uniform delivery	"Normal" LB	"Normal" LB
Delivery < Uniform delivery	LB↗	LB↘

So that a non-uniform delivery profile can be recognized in the load-balancing price, it is converted to a uniform profile, which is what is meant by volume transposition.

The transposed consumption is established as follows:

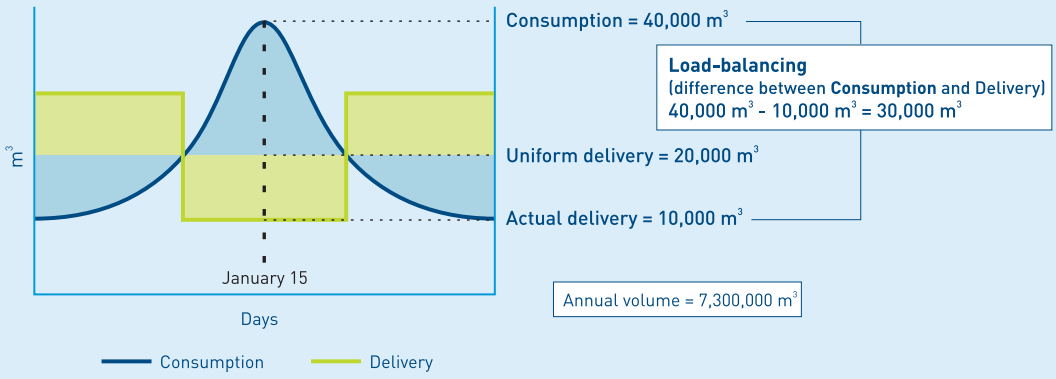
$$\text{Transposed consumption} = \text{Actual consumption} - \text{Actual delivery} + \text{Uniform delivery}$$

The calculation is made each day in order to obtain the new transposed consumptions. The new **A**, **W** and **P** parameters, which are required to determine the load-balancing price, are then evaluated on this basis.

To illustrate this transposition, let's assume that a customer has an annual volume of 7,300,000 m³ and withdraws 40,000 m³ on a particular.

If, during that day, the customer delivers 10,000 m³, the customer's load-balancing need for the day is:
40,000 m³ — 10,000 m³ = 30,000 m³.

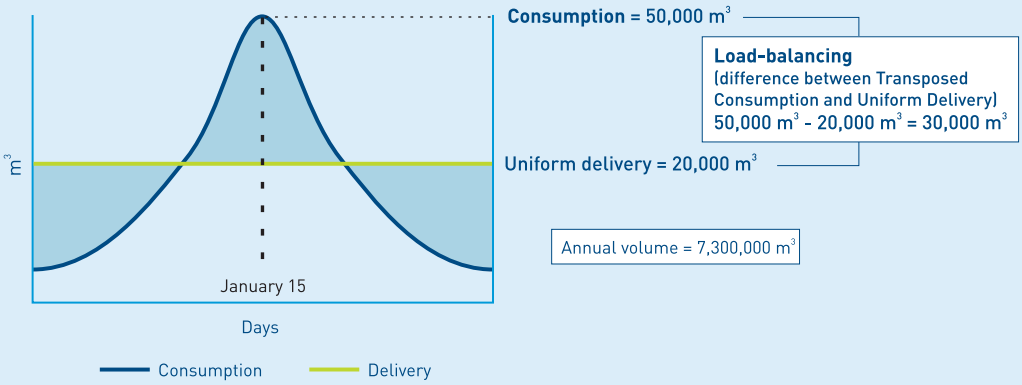
Load-balancing needs as at January 15 based on actual delivery profile (before transposition)



Based on the example above, the uniform delivery profile of that customer is 7,300,000 m³/365 days = 20,000 m³/day.

That day's transposed consumption is therefore 50,000 m³, i.e. 40,000 m³ — 10,000 m³ + 20,000 m³, which gives the same load-balancing need of 30,000 m³.

Load-balancing needs as at January 15 based on actual delivery profile (after transposition)



CUSTOMER-PROVIDED SERVICE

Under certain conditions, customers may provide their own load-balancing service. In such cases, they have to deliver the exact volume they consume every day.

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