

Tested by  
our reporter  
**Fabien Calvet**



**Records** don't get beaten for no reason. The Volvo we test drove had a truly aerodynamic trailer.



# Volvo FH 460 LNG Euro 6

## THIS GAS VOLVO

### REALLY BLEW US AWAY

AT A TIME WHEN GAS PRICES ARE SOARING, OUR TEST, CONDUCTED BEFORE THIS SUDDEN INFLATION, DEMONSTRATES THAT VOLVO HAS PULLED OFF A MASTERSTROKE IN COMBINING RECORD CONSUMPTION WITH PERFORMANCE. FOCUS ON THE NEW FH13 IN ITS LNG VERSION.



**LNG** requires a specific procedure. Make sure to do everything in the right order for safety's sake.

#### OUR VERDICT

- ★★★★ **Very good:** engine efficiency, performance equal to that of a diesel with the same power, new prediction system, VDS, general quality of the cab.
- ★★★ **Good:** driving position and new interior fittings, Trailer Brake System.
- ★ **Passable:** three tanks to be filled.
- ☆ **Could do better:** the roof curtain is still operated manually.

**I**n March 2019 we published the test of the previous-generation Volvo FH 460 LNG. It had ticked all the boxes, and then some! Never in the history of our Rhône-Alpes circuit had a truck running on gas achieved such a score.

Fast, smooth-running on the difficult sections of our circuit, light on fuel consumption, the FH 460 GNL had really impressed us! So what of the new-gen FH 460 GNL? Does it match up to expectations?

Before getting down to brass tacks, let us recap the mechanical fundamentals of this Volvo LNG. If you haven't read the test report in *FranceRoutes* #444, let us point out that Volvo has opted for the technology from the Canadian Westport company. Its system operates without glow plugs, in a diesel cycle with ignition by compression. The gas is stored in liquid form in a cryogenic tank, and it then passes into gaseous phase before being injected directly into the piston combustion chamber along with a tiny quantity of diesel. The compression ratio is that of a diesel engine: the diesel ignites and in turn ignites the natural gas that provides the power. This marks a major difference compared to the traditional ignition system used on other classic gas engines, with an operating cycle comparable to petrol-type spark-ignition engines.

#### High-performance gas engine

The technology chosen by Volvo presents several advantages, the first and most important of which is efficiency.

Thanks to the Westport technology, the compression ratio is that of a diesel engine.



**Personal protective equipment** is mandatory, since the liquid gas has a negative temperature of around -150°C.



**New** on all Volvos: extra indicator light on the doors.



**The side boxes** are nice and spacious, with the gas FH identical to the diesel FH in this regard.

**Choosing** your steering settings: only Volvo can offer this possibility, with its VDS. It's the tops!



**The central screen** can also be used for viewing the image from the camera placed beneath the rearview mirror.



**Comfort** worthy of the best: the new FH is a market trendsetter.



**The coffee maker option** on rails beneath the bunk is a real plus point.



**A handy touch:** this little water tank for hand washing.



**Exceptional:** our Volvo had a superb integrated side box in the right fairing.



**Driving optimisation** remains the key to efficient consumption. The Volvo has a fine coaching system.



**It's the small details** that count. The Swedish designers are the only ones to have thought of this. Bravo!



**Boxes.** As with almost all the truck manufacturers today, the boxes can be accessed from outside, and these trays are a real plus point.



**Several** new storage areas are available on the FH, for improved driver comfort.

Both are fuel-efficient, but the FH LNG beats the FH diesel.

On this point, our FH outclasses the other big LNG trucks with its excellent stats: 460 hp from 1700 to 1800 rpm and maximum torque of 2300 Nm available from 1050 to 1300 rpm, which our test was able to confirm. Better yet, the FH LNG was even able to beat its cousin, the very latest FH 460 in its diesel version, which already boasted low consumption figures (see FranceRoutes #476).

**With the gas engine, the noise level in the cab is reduced and the atmosphere is cosier.**

Let us take as an example the crossing of the mountainous part of our circuit. For the ascent of our measurement zone at the Col de Ceignes, the FH 460 LNG recorded a time of 8 minutes 18 seconds, whereas the FH 460 diesel did it in 9 minutes 5

seconds. It was the same for the Col d'Évires, with a time of 10 minutes 27 seconds for the diesel model and 9 minutes 19 seconds for the gas version.

The best times yet. More surprising still, it was a pleasure to drive, even when your preference is for the diesel engine drive feel. We are all generally aware of the fact that trucks running off

gas aren't the most thrilling of rides for truck drivers. A little slack in response, with frequent gear changes on account of the restricted rev-range, you don't get pinned back to your seat during the acceleration phases.

With the FH13 LNG it's

quite different, and if you didn't know this was a gas-powered truck you could be easily fooled into thinking otherwise, such is the quality of its performance. One detail that normally marks the difference between a gas-powered engine and a diesel version is the ambient noise in the cab. This does not apply here, what with the diesel cycle of this engine having a compression rate identical to that of a classic D13 engine. To recap, a conventional gas engine has a lower compression rate, and therefore offers a reduced noise level and a cosier atmosphere at the wheel.

**Three tanks for one truck**

So much then for the advantages of this Westport technology; let us now consider the



**Basic** but still just as functional. The side sun visor is a valuable feature.

**Permanently knowing** your vehicle weight: this is an indispensable tool.



**The new look** is a real success, with only this unfortunate sticker to spoil the photo!



**And here** is the solution to replace the sticker: a camera that eliminates the blind spots.

disadvantages. If you take a close look at the truck, you will notice that it has three tanks. The first (the biggest) is for the gas. On the model tested, it had a capacity of 205 kg, and it was easy to spot as our tractor unit had no side fairing. The second tank is for the diesel, with a capacity of 175 l. This isn't especially large, but quite proportionate considering the low consumption, which here is 1.2 l/100 km. There remains a third tank for the AdBlue, because when you have diesel you also have AdBlue. It is worth noting that even with a small amount of diesel, under these pressure and temperature conditions the intake air generates nitrogen oxides (NO2) which then need to be treated with AdBlue in the exhaust via an SCR catalytic converter.

It's a shame, but that's how it is. You need to fill up three times, and it is rare to find a service station offering the three products at the same location. Remember to factor in additional time for conducting these operations, even if only to change from one pump to another.

To finish off with the disadvantages, the fact of having three tanks restricts the space for housing a second LNG tank, and therefore limits the range of the truck. You can expect around 1000 km between refuellings, which is less than the main competitor, the S-Way 460, but since the fuel consumption is far less with the Volvo, this drawback is offset.



**Classic**, and with generous dimensions, the fridge sliding under the bunk should be mandatory!



**New steps** with anti-slip system. Yet another safety improvement.

**No fairing** on the left-hand side. A shame, since not only is the gas tank not particularly attractive, but the truck really looks fabulous when viewed from the right-hand side!



**Small diesel tank:** the truck only consumes around 1.2 l/100 km.

## The FH has three tanks, and rare alas are the service stations to propose all three products...

Concerning the space on board, on our vehicle, the remaining space beside the diesel tank has been used to install a splendid storage box integrated in the fairing, something never seen on a French vehicle, but which is quite frankly the tops.

### Smart braking that surprises you

This is nothing new, and Volvo is not the promoter of the secondary retarder. Unlike its Swedish competitor, which almost always fits it as standard, the discourse has always been to promote the VEB+ (Volvo Engine Brake), considered to be the ultimate weapon. However, each time

we have had a truck without a Voith retarder on our circuit, it has always struggled. Yet this is a thing of the past, as this time, the new system - called the Trailer Brake System - is a pleasant surprise.

This is nothing like the system of a lever on the dashboard such as we had on the old trucks: here, everything is automatic. In concrete terms, when you program your cruise control on a descent, the truck first uses the VEB+, and when this is no longer sufficient the truck independently brakes the trailer only, in order to reduce the overall speed while ensu-

### The Trailer Brake System enables full tractor brake power to be maintained in the event of an emergency.

ring stability. This is surprising as well as highly efficient, since the brakes of your tractor unit maintain full power in the event of an emergency. Be reassured, nonetheless, that the truck does not slam the brakes on the wheels of the trailer. The procedure is quite gentle and therefore does not overly affect break wear-and-tear. Be that as it may, this isn't to say, either, that it has absolutely no effect on the wear-and-tear whatsoever; it is something that will need to be analysed from the initial feedback.

**In conclusion**, this LNG tractor does not present the traditional weaknesses of models running off gas. Here we have the best of both worlds, with performance, low consumption, and the precious Crit'Air 1 certification, which today is the ecological Holy Grail. Nevertheless, since the time when this test was conducted, one key point has changed: the price per kilogram of gas! This is the big headache right now. It is a major problem which is not greatly discussed, and certainly not by the ecologists who for years have been pushing to see diesel driven out. Even if all types of fuel have been subject to record inflation, the rising prices of gas have truly rocketed. Without going into detail, this is a point that needs underlining and which really has to be taken into account when calculating the running costs of your vehicle.

FABIEN CALVET

# UNDER THE HOOD OF THE VOLVO FH 460 LNG EURO 6 RECORD CONSUMPTION

In its new 2022 incarnation, the Volvo FH 460 LNG posts better results than the previous model. More accomplished, more precise: what are its secrets? Comfort, safety, performance: focus on what's new with this latest model.

**W**ith the arrival of the latest-generation FH, Volvo underscores its positioning in terms of comfort and safety.

The fine consumption figures are sure to bring a smile to the faces of our Swedish friends, since, according to the results of our test, this FH 460 LNG outclasses all its peers. With an average consumption of 18.2 kg/100 km over the entire 420 km of the test circuit, it blitzes the record. The same applies for the diesel consumption, which is 1.2 l/100 km.

For the test presented in FranceRoutes #444, the previous-generation 460 LNG had produced a score of 21.8 kg/100 km for gas and 1.85 l/100 km for diesel. The improvement is therefore spectacular, for an equivalent commercial speed. The prediction system is far more efficient, which in part explains this progress, but this is not the only difference. For the test conducted in late 2018, we had a truck equipped with an I-Shift AT 2612F gearbox and an RSS1144D axle, with a 2.64 ratio. This time, the FH LNG is still equipped with an I-Shift AT 2612F gearbox, but its engine is an RSS1244B with a ratio of 2.47. This is a difference that may pass unnoticed for the uninitiated, but which is the final piece in the puzzle of this spectacular improvement.

### A truck to suit you

While everyone may agree on the stats for our Volvo, the level of driving comfort is also top of the range. Adaptive Cruise Control, VDS with lane keeping aid, emergency braking, Trailer Brake System: nothing is left out, and all these technologies are there to assist the driver while giving him control over his driving.

Take the VDS, for example. While this electrical steering aid basically provides safety



**With this Volvo LNG** you have three tanks to fill.

**You must never forget to** clean the valve openings before filling up with gas.



**Don't forget the AdBlue**, a mandatory additive with diesel.

### Hill performance

Col (6% gradient)	Ceignes - 646 m - 7.1 km		Évires - 803 m - 10.4 km	
	Max. %	Summit	Max. %	Summit
Speed (km/h)	45	84	57	62
Engine speed (rpm)	1300	1100	1300	1100
Gear	9	12	10	11
Time	08:18		09:19	

## The consumption improvement is spectacular, for an equivalent commercial speed.

options such as lane-keeping in the event of attention lapses, it also offers drivers the possibility of adjusting their steering parameters.

With certain competitor trucks, you often hear the

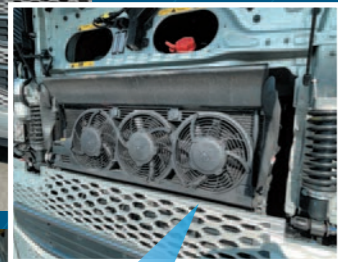
complaint that the steering is too hard or, occasionally, too soft, and here it is the driver who decides. Stable, firm, varied speed of return: you can tweak the settings to your heart's content using the

control screen in the centre of the dashboard.

Choose the VDS in the menu and configure it to your liking. It's smart, really easy to adjust, and remarkably efficient.



**All the checks** and other maintenance operations have been well thought through.

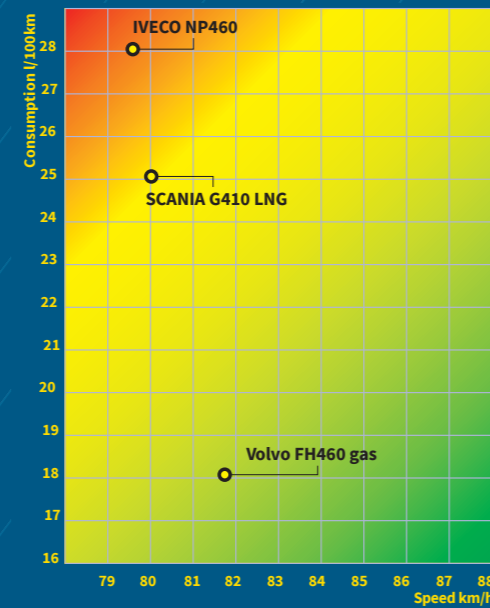


**Air conditioning** with the engine turned off: a plus point for resting in high summer.



**Don't look** for the on-board tool kit in the boxes: it is placed at the front of the truck.

**Performance graph**  
The gas maxicodes tested on the Rhône-Alpes route



Model	Consumption	Commercial speed
<b>IVECO STRALIS NP 460</b>	28.1 kg gas per 100 km	79.63 km/h
<b>SCANIA G410 LNG:</b>	25.1 kg gas per 100 km	80.03 km/h
<b>NEW VOLVO FH13 460 LNG:</b>	18.2 kg gas per 100 km	81.87 km/h

Note: + 1.2l/100 km of diesel + 1.2l/100 km of AdBlue

Stable, firm, varied speed of return: tweak the settings to your heart's content using the control screen in the centre of the dashboard.

**FranceRoutes Rhône-Alpes circuit**

Stage	Distance		Drive time	Average speed (km/h)	Consumption (kg volume of gas)	AdBlue (l)
	Clock	Benchmark				
Mâcon	15,002.00					
	104.80	107	1 h 19 min 35 s	80.67	22.76	1.50
La Michaille	15,106.80					
	100.50	98.5	1 h 14 min 56 s	78.87	46.28	2.70
Fontanelles	15,207.30					
	213	214.5	2 h 33 min 18 s	83.95	-	-
Mâcon	15,420.60					
<b>Global</b>	<b>418.60</b>	<b>420.00</b>	<b>5 h 07 min 49 s</b>	<b>81.87</b>	<b>76.54</b>	<b>5</b>

●●● What is more, if there are several drivers using the truck, there is no risk of a colleague messing with your settings, since as soon as you insert your driver's card the truck remembers your chosen settings as well as your favourite radio stations.

**Improved management software**

The FH 460 GNL has the same safety tools as its diesel cousin. With its new Adaptive

**The Adaptive Cruise Control system brings the truck to a complete standstill in the event of emergency braking.**

Cruise Control system, the truck can be brought to a complete standstill in the event of emergency braking. It also alerts you to the distances between vehicles and, as stated previously, it is capable of lane-keeping correction in the event of a lapse in concentration. On our circuit, I was also able to make out that the truck

management software had also been improved. As the kilometres went by, it was easy to see that the contour prediction system anticipates the slightest uphill gradient and uses the freewheeling mode to the max. These additional assets also help to explain the good consumption figures. On our Rhône-Alpes

circuit, which is far from being the easiest of routes, the FH 460 LNG changes gears at just the right time, and even if the maximum torque range remains modest compared to the D13 diesel, the I-Shift transmission compensates perfectly for this, and this all goes perfectly smoothly.

**Volvo FH 460 LNG Euro 6**

**Engine**

Volvo G13C 450 (Euro 6 with SCR); Inline-6, bore/stroke: 131/158 mm; total displacement: 12,8 l; Dual Fuel Type 1A European type-approval; one-piece cylinder head with overhead camshaft; 4 valves per cylinder; rear distribution; common rail high-pressure fuel injection; special feature of the Volvo Dual Fuel system: the concentric injectors allow the almost simultaneous supply of diesel and methane in gaseous form; intercooled supercharger with turbocharger and air-to-air heat exchanger, max. power: 460 hp from 1700 to 1800 rpm; max. torque: 2300 Nm from 1050 to 1300 rpm; VEB + integrated retarder; max. engine braking effect: (375 kW) 502.88 hp at 2300 rpm; dry weight: 1130 kg.

**Transmission**

Clutch: dry single-plate; Volvo I-Shift automated electro-pneumatic control. Gearbox: Volvo I-Shift AT 2612F with automated control; aluminium alloy housings: basic gearbox with three non-synchronised gears combined with a range-change and a synchronised splitter gear: the combination provides 12 forward

gears and 3 reverse gears; integrated oil cooler. Rear axle: type: RSS1244B, hypoid single reduction, pneumatic control differential lock; direct drive output; final drive ratio: 2.47.

**Steering**

Volvo Dynamic Steering (power steering).

**Suspension**

Front: pneumatic. Rear: 2-cushion air suspension; axle guidance by lower longitudinal bars; 2 hydraulic shock absorbers and anti-roll torsion bar; electronic chassis height management.

**Braking**

Electronic Braking System (EBS) and integral disc; Electronic Stability Control (ESP), Anti-lock Braking System (ABS) and traction control (ASR); Hill Start Aid; Electric Park Brake (EPB).

**Chassis**

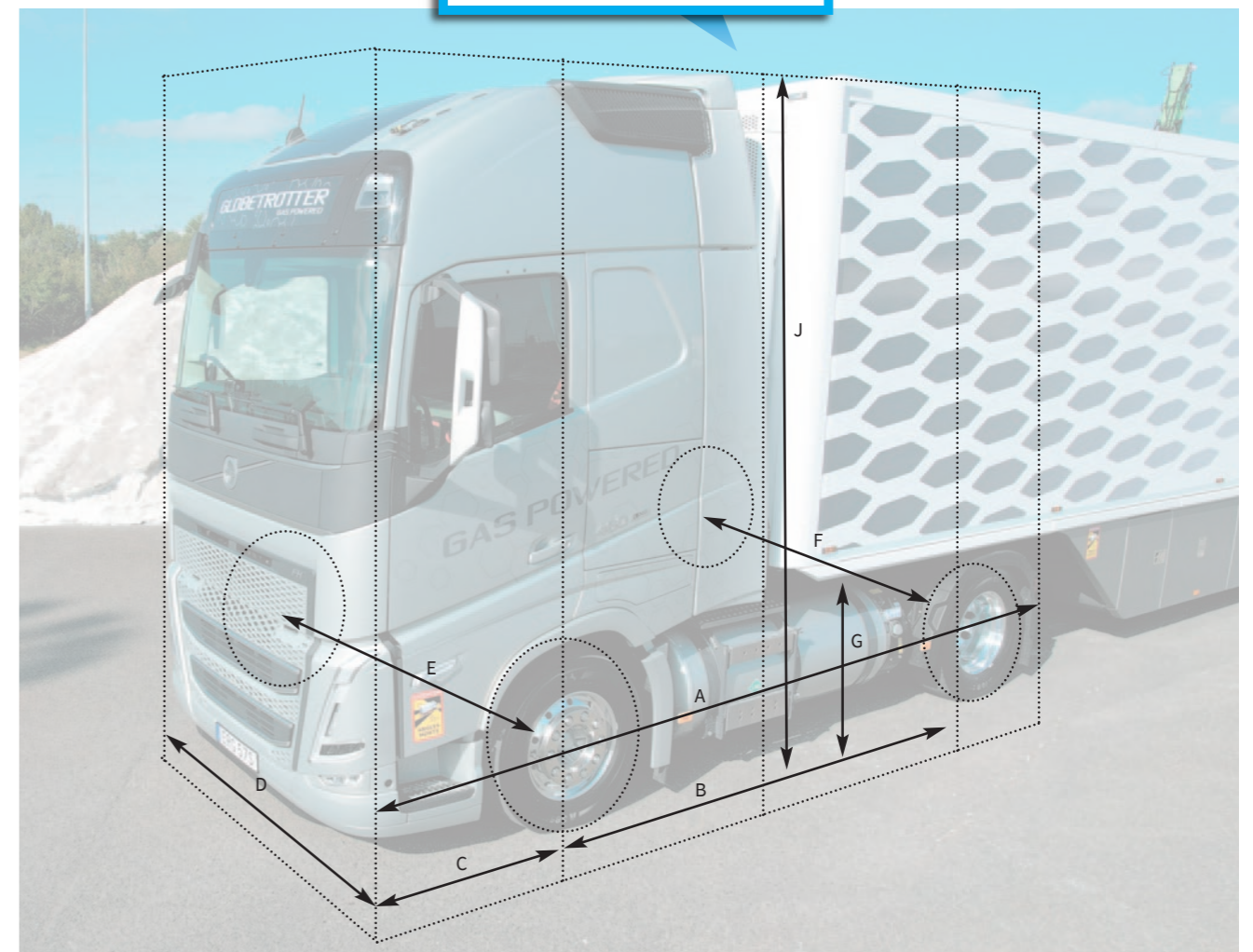
Ladder-type, made of high-strength steel: riveted and bolted; constant-section U-beams: section size (in mm): 266 x 90 x 7.

**Weight (t)**

Service weight: 8.03 t with full tanks, cryogenic LNG 205 kg / 495 l / 2150 mm x 710 mm (on the left-hand side of the truck), diesel 170 l + AdBlue 64 l (on the right-hand side of the truck), three-dimensional deflector, side fairings, light alloy wheels. GVWR: 19 t. Max. weight: front: 7.5 t; rear: 13 t. GCWR: 39.50 t (for the test, hitched to a Volvo Aero+ semi-trailer with fairings).

**DIMENSIONS (in m)**

A : overall length	5.91 m
B : wheelbase	3.7 m
C : front overhang	1.38 m
D : overall width	2.49 m
E : front track	2.20 m
F : rear track	1.83 m
G : fifth wheel height	1.10 m
J : overall height	3.96 m





A really great look,  
with this semi and its optimised Cx.



Since the batteries are located in the chassis at the rear, Volvo has paid attention to the wiring terminals, since you never know when you might need them...



The secret weapon for absolute comfort: the "Volvo Dynamic Steering" or VDS!

## THE VOLVO FH 460 LNG COMPARED TO ITS COMPETITORS

VOLVO FH 460	IVECO Stralis Hi-Way AS 440 S 46 T/P	SCANIA R 410
<b>ENGINE</b>		
Volvo G13C460 Euro 6	FTP Cursor 13 CNG Euro 6	Scania OC13 101/410 Euro 6
<b>ARCHITECTURE</b>		
Inline-6	Inline-6	Inline-6
<b>BORE/STROKE</b>		
131/158 mm	132/150 mm	130/160 mm
<b>DISPLACEMENT</b>		
12.8l	12.8l	12.74l
<b>DRY WEIGHT</b>		
1130 kg	1240 kg	1130 kg
<b>MAX. POWER</b>		
460 hp between 1700 and 1800 rpm	460 hp at 1600 rpm	410 hp at 1900 rpm
<b>MAX. TORQUE</b>		
2300 Nm from 1050 to 1300 rpm	2000 Nm from 1100 to 1575 rpm	2000 Nm from 1100 to 1400 rpm
<b>SPECIFIC POWER</b>		
35.93 hp/l	35.71 hp/l	32.18 hp/l
<b>AUTOMATIC GEARBOX</b>		
Volvo I-Shift AT2612F 12 gears	Hi-TroniX (ZF) 12 TX 2210 TD 12 gears	Scania Opticruise G15 12 gears
<b>REAR AXLE (SINGL RÉDUCTION)</b>		
Meritor RSS1244B	Meritor MS 17X EVO	Scania R 780

## The FH 460 LNG offers an excellent compromise between performance and commercial speed.

### More energetic than its diesel cousin

In terms of driving comfort, this FH 460 LNG was a far more pleasant drive than its cousin, the FH13 I-Save, test-driven over the same circuit. As paradoxical as this may seem, the LNG model offers better response when hitting the accelerator pedal. This is no doubt because the I-Save diesel has been deliberately configured for very flexible engine management at low engine speeds, as we could observe for ourselves in the test in France-Routes #476. Here, the FH 460 LNG offers an excellent

compromise between performance and commercial speed.

In comparison, the time taken to cover our 420 km was 5 hours 7 minutes for the gas model compared to 5 hours 13 minutes for the FH diesel: 6 minutes difference that are far from negligible. After this new test, even though I am no great fan of trucks running off gas, I have to admit that the LNG model from Volvo has nothing to envy from a diesel.

**To conclude**, in terms of performance and consumption, this new FH 460 LNG is the best truck in its category. It has

to be said however that the economic viability of gas is seriously called into question on account of the rise in the pump prices. This is a point that needs to be studied carefully, since the Ukrainian conflict risks exacerbating the phenomenon and could even bring to a complete halt the progress of trucks running off gas.

Even if ecology is a priority for everyone, profitability remains the haulier's prime concern. Running costs have skyrocketed in recent months, without the haulage service

prices being able to keep pace with this. Gas no longer has an advantage over diesel, even if diesel too is going up in price, but to a lesser extent. This is really a shame, since in terms of technology the FH LNG proves that it is possible

### The LNG model offers better response when hitting the accelerator pedal than its diesel cousin.

to use gas while maintaining a good commercial speed. Crit'air 1 certification already came at a price, which is now starting to look increasingly unrealistic: you will need to do the calculation for yourself.

FABIEN CALVET