



Market Opportunities 2023

1. Market Opportunities

1.9.1. New Opportunities in the Gas Business: Fuel change-over -



Project for vehicle change-over from Diesel or Gasoline to NGV for TGI's personnel land transport fleet.



30% reduction in environmental impact (opacity test).

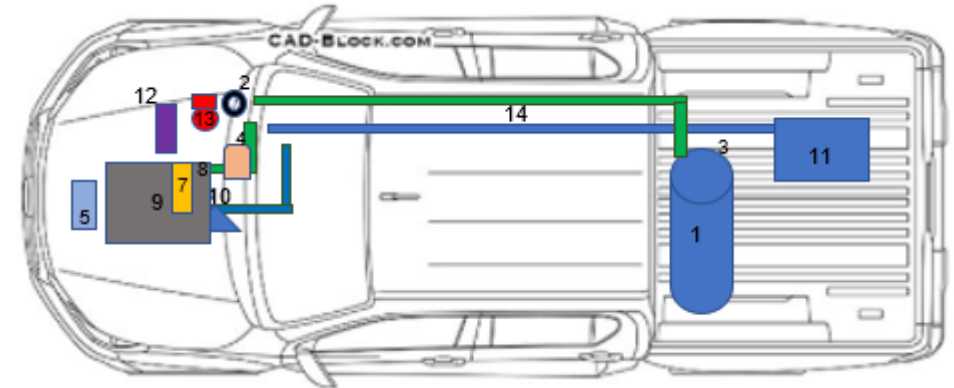
30% savings in fuel.



Improved vehicle power.



Stable behavior of engine temperature, <1000C.



Components:

1. NGV storage cylinder
2. NGV pressure manometer
3. NGV storage cylinder control valve
4. NGV pressure reducer
5. Air filter
6. NGV injectors system
7. Engine air intake manifold
8. Intake pressure sensor
9. Diesel engine
10. Diesel injectors system
11. Diesel fuel tank
12. NGV system computer
13. NGV system loading valve
14. NGV high-pressure pipes



Sustainable Mobility with Vehicles 100% on Natural Gas 2023

Tractor trailers



Buses



Dumpers



Compactors



Vans



Over 650 active EDS
+200 workshops



Over 600,000
vehicles converted
Over 190,000
currently active



Over 1,000 trucks
dedicated to NGV



Over 3,000
to transport
passengers



1. Market Opportunities

1.9.1. New Opportunities in the Gas Business: Fuel change-over - Cálidda

CNG vehicles/ infrastructure

Calidda distributes natural gas to the refueling station network (CNG for vehicles - NGV). The NGV market is controlled by a system that monitors NGV conversions, vehicle consumption and dispatches from taps. This system is managed by a third party.

What has been achieved thanks to using Natural Gas for Vehicles (NGV) in recent years?

- Financiamiento GNV
- Beneficio de usar GNV
- Simulador de ahorro
- Financiar mi conversión vehicular GNV
- Comprar mi vehículo a GNV
- Estaciones que venden GNV
- Revisiones periódicas
- Atención al cliente

Type and # of vehicle	ene-23	feb-23	mar-23	abr-23	may-23	jun-23	jul-23	ago-23	Set-2023	oct-23	nov-23	dic-23
Car	249,541	251,739	255,937	258,275	260,541	262,678	264,700	266,910	270,480	273,974	275,857	279,230
Truck	983	1,021	1,078	1,089	1,111	1,124	1,144	1,159	1,185	1,266	1,296	1,346
Other	35	35	34	32	32	32	33	35	34	33	33	33
Public transport	4,536	4,615	4,750	4,829	4,893	4,956	5,034	5,148	5,227	5,326	5,346	5,430
Trimovil	2,950	2,951	3,011	3,020	3,029	3,059	3,070	3,099	3,121	3,134	3,199	3,210
Grand Total	258,045	260,361	264,810	267,245	269,606	271,849	273,981	276,351	280,047	283,733	285,731	289,249

Light mobility:

There are currently more than 280k light customers who have NGV in their vehicles.

Heavy mobility:

There are currently more than 5,430 customers in the bus category and 1346 trucks that have NGV.

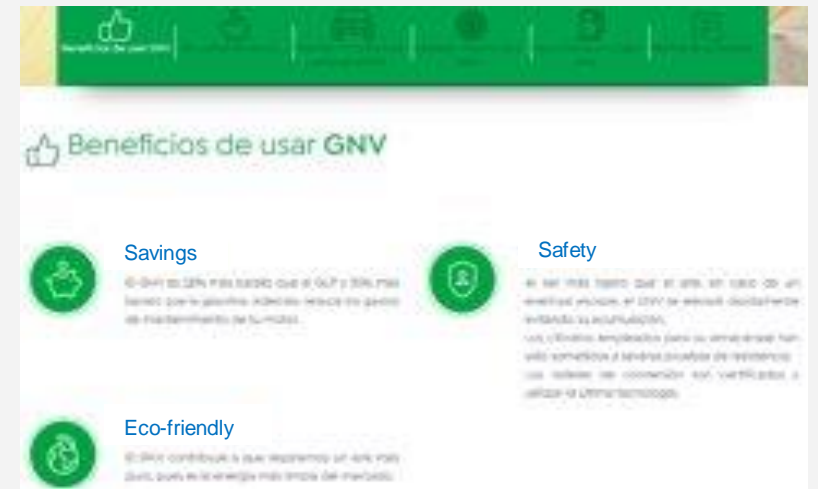
Likewise, 281 stations are connected to our distribution network, serving drivers who have NGV in their vehicles.

<https://portalgnv.calidda.com.pe/home>

1. Market Opportunities

1.9.1. New Opportunities in the Gas Business: Fuel change-over - Cálidda

281 NGV fueling stations



Beneficios de usar GNV

- Savings**
El GNV es un 28% más barato que el GLP y 30% más barato que el gasolina. Además, reduce los gastos de mantenimiento de tu motor.
- Safety**
El GNV es un gas más seguro que el GLP y el petróleo. Es un gas inerte, no se inflama y no se oxida. Además, el GNV se almacena a baja presión y a baja temperatura, lo que garantiza la seguridad de su uso. El GNV es un gas más seguro que el GLP y el petróleo. Es un gas inerte, no se inflama y no se oxida. Además, el GNV se almacena a baja presión y a baja temperatura, lo que garantiza la seguridad de su uso.
- Eco-friendly**
El GNV contribuye a que nuestro planeta sea más verde, pues es la energía más limpia del mercado.

1. Market Opportunities

1.9.1. New Opportunities in the Gas Business: Fuel change-over -

HVAC (Gas heat pump)

Did you know that you can also keep your business spaces cool at a lower cost than electric alternatives?

In Japan, nearly 30% of air conditioning needs and 65% of new installations are powered by Natural Gas. Likewise, countries such as China, India and South Korea have made Natural Gas cooling technologies a preferred choice for developing areas.

Applications

Natural gas CHP (Gas Heat Pump) systems are ideal for restaurants, department stores, showrooms, as well as hotels, office buildings, universities, schools, care centers, sports clubs, factories and a multitude of other applications.



1. Market Opportunities

- 1.9.1. New Opportunities in the Gas Business: Fuel change-over- Gas home appliances - Calidda

Calidda has a business line of home appliances that promotes natural gas use.

Through its website, Calidda offers financing options for gas home appliances. Some of the options include stove sets, ovens, dryers, laundry centers.



COCINA SGA BLANCA 20" + CONEXIÓN

Desde **S/25.73*** al mes

Precio regular: S/ 980.00

Tienda virtual: S/ 882.00

¡Ahorra S/ 98.00 !

¡Compra Ya!

(*) Plazo GSD 8 años. Cuota no incluye IGV del interés.



COCINA SOLE 24" VARADERO + CONEXIÓN

Desde **S/42.61*** al mes

Precio regular: S/ 1,623.00

Tienda virtual: S/ 1,460.70

¡Ahorra S/ 162.30 !

¡Compra Ya!

(*) Plazo GSD 8 años. Cuota no incluye IGV del interés.



TERMA JASA INSTANTANEA 5.5 LT + CONEX + PUNTO ADIC

Desde **S/36.99*** al mes

Precio regular: S/ 1,409.00

Tienda virtual: S/ 1,268.10

¡Ahorra S/ 140.90 !

¡Compra Ya!

(*) Plazo GSD 8 años. Cuota no incluye IGV del interés.

1. Market Opportunities

1.9.1. New Opportunities Fuel change-over – Hydrogen TGI



Foto: NISSAN FRONTIER NP 300 a Diesel

Status and Change

- H2 production with electrolyzer (HYEDCO - life device) and injection into the vehicle engine.
- Tests of vehicle operation and performance with Diesel and "dual" fuel (Diesel - H2).
- The tests were carried out in stationary and transient or dynamic regime.

Description

- Environmental assessment of emissions and performance evaluation for vehicles operating with Diesel and dual fuel (Diesel - H2) of interest to TGI - Grupo Austral and Nissan.

Why is it relevant and what are we seeking to prove?

- The aim is to characterize pollutant emissions such as CO2, CO, HC, NOx and PM in order to determine their reduction using HYEDCO technology - life device.
- Determine the savings in fuel consumption using HYEDCO technology.

TRL	BRL
8	8

Allies

HYEDCO
Grupo Austral



Instituto tecnológico Pascual Bravo

Milestones or Sprints



- Oct 22 ● Feasibility meeting
- Dic 22 ● Test starts
- Ene 23 ● Laboratory tests
- Feb 23 ● Installation and adjustment
- Ene - Mar ● Evaluation and follow-up
- Abril ● Presentation of results

Impacts

- Reduction in pollutant emissions: CO2 (41%), NOX (9%), PM (14%) and HC (24%).
- Fuel efficiency improvement (17%).
- 66% reduction in opacity test. Oxygen production equivalent to 86 trees.

Pilot implications

1. Energy consumption
2. Performance demonstration (Pre- and post-pilot)
3. Scaling up
4. Business model definition

1. Market Opportunities

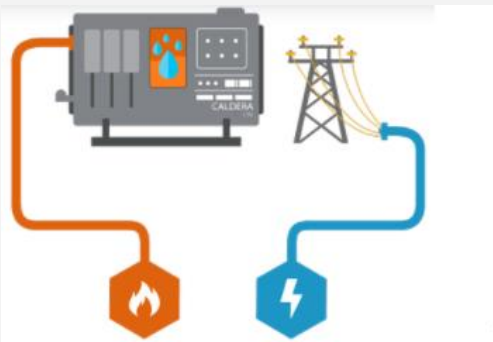
1.9.1. New Opportunities in the Gas Business: Energy Efficiency - Calidda

Natural Gas co-generation

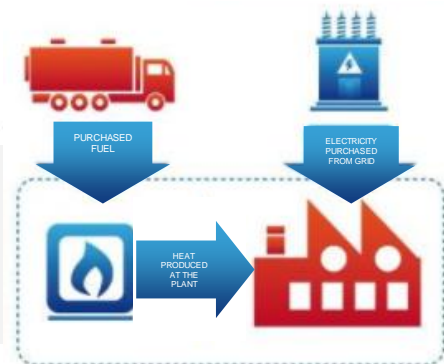
Co-generation consists in simultaneously producing thermal energy and electricity at a customer's facilities, using equipment specially designed to this effect.

We help you to be more efficient

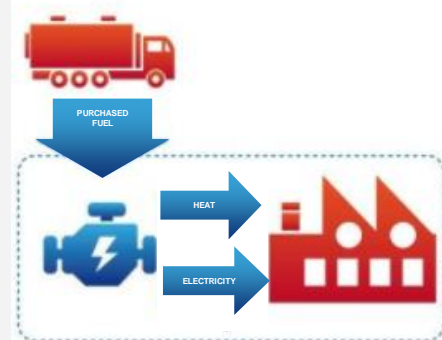
Co-generation increases energy efficiency by simultaneously generating electricity and heat. The excess heat produced by electricity generation at a site or industrial process can be used for processes that require hot air, hot water, steam, cooling or electric energy, among others.



WITHOUT COGENERATION



HEAT PRODUCED AT THE PLANT



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1.9.1. New Opportunities in the Gas Business: Energy Efficiency - TGI

ISO 50001



Currently 12 of our offices and compression stations are certified under the ISO50001 (Energy Management) Standard.

1. Market Opportunities

1.9.1. New Opportunities in the Gas Business: Energy Efficiency - Calidda

Example of campaigns promoting energy efficiency

Energy generation may be an attractive alternative to buying electricity from the local electric power company. Self-generation consists in producing electric power at the user's facilities using a generator set, turbines or micro-turbines. Self-generation projects are custom-designed taking into consideration current electricity consumption and the hours during which most savings would be achieved, either through continuous use or use during peak hours (peak shaving).



Self-generation benefits

- Energy cost savings
- Reliability

- Energy quality
- Risk management

1. Market Opportunities

1.9.1. New Opportunities in the Gas Business: Energy Efficiency – TGI efficiency in Teas.

Scope	Target	Progress	% progress
Reduce emissions of purge gas and fuel gas from the stations by teas	Shut down 13 compressor station teas to reduce 60% of emissions from these systems	The pilot was successful, and the shutdown of all flares in the infrastructure has begun, with six stations and the remaining stations already scheduled for shutdown.	50%

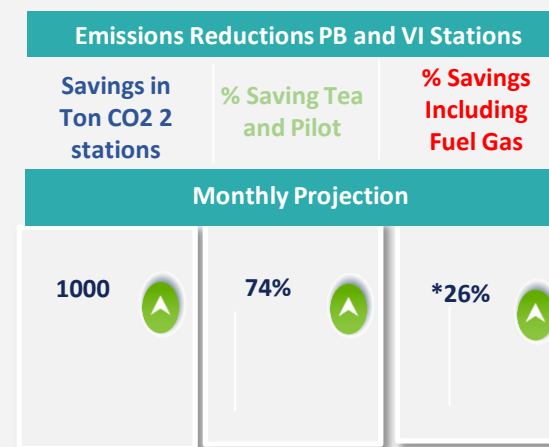


Current Emission Calculation Based on Report years 2023

Current Emission Calculation Based on Teas Shutdown implemented off

Station	Pilot Gas TonCo2/month	Purge Gas TonCo2/month	Blowdown	Total TonCo2
Villavicencio	28.2	10.45	0.8	39.46
Paratebuena	114.6	17.4	0.8	132.83
Hatonuevo	296,3	62,4	x	358,7
J del Pilar	145,8	68,8	x	214,7
Casacara	44,3	52,9	x	97,2
Curumani	271,4	67,0	x	338,4
Norean	287,7	17,6	x	305,4
San Alberto	287,7	54,5	x	342,2

Station	Pilot Gas TonCo2/month	Purge Gas TonCo2/month	Blowdown	Total TonCo2
Villavicencio	0	0	0.8	39.46
Paratebuena	0	0	0.8	132.83
Hatonuevo	18,0	1,2	x	
J del Pilar	4,1	0,6	x	
Casacara	1,7	1,7	x	
Curumani	0,0	0,0	x	
San Alberto			x	
Norean			x	



1. Market Opportunities

1.9.1. New Opportunities Energy Efficiency - ElectroDunas

BESS System Llipata (Photographic Record)



Project with a capacity of 1 MW/1.5 MWH of energy, located at SET Llipata.
This system is powered by Lithium-Ion batteries and has 5000 charge and discharge cycles. Useful life of 13 years

1. Market Opportunities

1.9.1. New Opportunities in the Gas Business: Renewable Energy - TGI

Biogas Pilot



Currently, TGI has partnerships with the Ministry of Science, Technology and Innovation and universities such as Universidad Antonio Nariño and Universidad del Valle to develop projects with university researchers to produce biogas from wastewater.

Watch video:

<https://www.youtube.com/watch?v=oR9gC7iq3Us>

1. Market Opportunities

1.9.1. New Opportunities in renewable energy (Energy from natural gas) – ElectroDunas

Thermal DGC Pedregal (Photographic Record)



Energy self-generation project

Distributed Generation Centers Luren and Pedregal located in the cities of Ica and Chincha, respectively. Their installed capacity is 20 MW each and their energy source is natural gas.

1. Market Opportunities

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Thermal DGC Luren (Photographic Record)



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1. Market Opportunities

1.9.1. New Opportunities Renewable energy - ElectroDunas

Solar Plant Ica Norte (Photographic Record)



The Ica Norte Photovoltaic Solar Plant, located in the Ica headquarters facilities.

Its installed power is 122 KWp with a useful life of 25 years.

The plant has 298 panels installed and a 100 KW three-phase inverter.

One of the project's relevant contributions is that we are avoiding 135 Tn of CO2 emissions per year.

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1.9.2. Current Investment Budget

Company	Gas and electricity investment in 2023 USD	Planned in 2024
Renewable energy		
TGI	\$ 112.382,56	\$ 2.070.280,78
Calidda	\$ 88.279,00	\$ 76.500,00
Electrodunas	\$ 234.008,13	\$ 0,00
Total renewable energy	\$ 434.669,69	\$ 2.146.780,78
Fuel change		
TGI	\$ 1.821.398,09	\$ 963.228,08
Calidda	\$ 168.008,00	\$ 100.500,00
Total fuel change	\$ 1.989.406,09	\$ 1.063.728,08
Energy efficiency		
TGI	\$ 482.393,48	\$ 103.582,62
Electrodunas	\$ 5.652.458,09	\$ 7.688.000,00
Total energy efficiency	\$ 6.134.851,57	\$ 7.791.582,62
Total	\$ 8.558.927,35	\$ 11.002.091,48

Total investment and budget		
Company	Investment 2023	Budget 2024
TGI	\$ 4.835.782	\$ 18.052.739
Calidda	\$ 114.523.000	\$ 111.081.202
Electrodunas	\$ 22.379.000	\$ 25.443.000
Total	\$ 141.737.782,25	\$ 154.576.941,27

Investment and Budget – market opportunities				
Company	Investment 2023	Budget 2024	% of total investment 2023	% of total Budget 2024
Renewable energy	\$ 434.670	\$ 2.146.781	0,31%	1,39%
Fuel change	\$ 1.989.406	\$ 1.063.728	1,40%	0,69%
Energy efficiency	\$ 6.134.852	\$ 7.791.583	4,33%	5,04%
Total	\$ 8.558.927,35	\$ 11.002.091,48		

1. Market Opportunities

1.9.3. Revenues from New Business Opportunities - Calidda

NGV service revenues (Equivalent to 8,9% of revenues in 2023)						
Year	2018	2019	2020	2021	2022	2023
USD	27,207,366	29,228,760	21,290,910	23,916,151	29.771.828	34.386.285
Tasa	2,956.55	3,277.14	3,432.50	3,981.16	4,255.44	4,325.05
COP	80,439,937,947	95,786,738,546	73,081,048,575	95,214,023,715	129,944,103,073	148,722,401,939

Period	2018	2019	2020	2021	2022	2023
Home	98,582	103,697	74,747	114,093		135,346
Commercial	5,661	11,786	8,462	9,511	142	13,275
NGV*	27,207	29,229	21,291	23,916	30,536	34,196
Large Clients	29,983	32,294	29,906	39,582	57,33	54,237
Fuel Flows	94,370	104,562	99,170	110,885	101,115	114,276
Other	21,744	26,476	16,425	34,026	38,028	33,066
Total	277,548	308,043	250,001	332,013	369,012	384,397
NGV share of total	10%	9%	9%	7%	8,3%	8.9%

* Amounts in USD

1. Market Opportunities

1.9.4. Smart meter penetration

The quantity considered for the pilot is 2690, with the support of inventories of equipment and facilities, descriptions of the functionalities, and descriptive document of the project, a summary of the quote, the list of supplies that were assessed, records of the installed meters, and information on the revenues collected



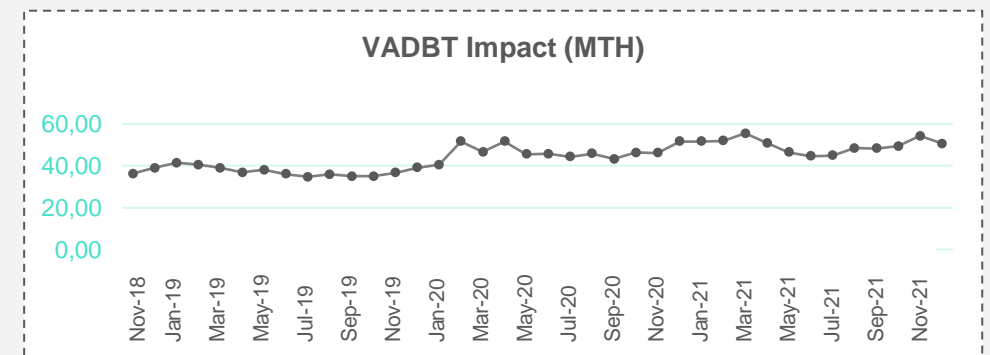
1.- Memoria descriptiva del proyecto SMI 2021.pdf



Photographic Record

Antenna	Series	Zone	IP	Office	Address
1	21751070	ICA	10.57.47.16	40149	Esquina de calle San Martin cuadra 1 con, Jorge Chávez cuadra 1
2	21751071	ICA	10.57.47.17	40152	Esquina de Calle Gral Salas cuadra 4 , con Raúl Boza cuadra 5
3	21751072	PISCO	10.57.47.18	30005	AV FERMIN TANGUIS CUADRA DOS PISCO
4	21751073	PISCO	10.57.47.19	30357	URB RENACER MZ 54 Y 37 PISCO
5	21751074	CHINCHA	10.57.47.20	20349	AV SAN LUIS CUADRA CINCO ALTO LARAN
6	21751075	CHINCHA	10.57.47.21	20254	AV .INDEPENDENCIA ESQUINA CALLE COLON ALTO LARAN

Location of the AMI antennas



Information of revenues collected



Grupo Energía Bogotá



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