



MIQ OVERVIEW FOR ENERGY SOLUTIONS CENTER

Pioneering methane certified gas



MIQ – ABOUT US

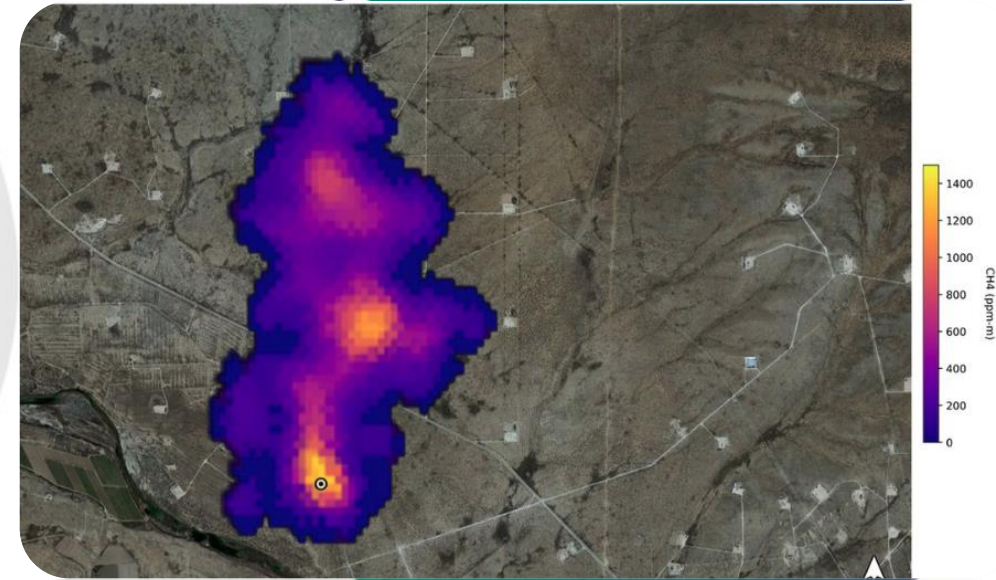
- **Not-for-Profit** foundation – launched by RMI and SYSTEMIQ in 2021
- **MiQ** means **Methane Intelligence**
- **Team of international experts from industry, trading, academia**
- **Market-based** theory of change
- **Independent** of operators, technology and auditors of the Standard
- **Performance Standard for Gas supply chain** - includes methane and GHG
 - A new Crude emissions standard was launched in 2024
 - Standard for MMRV (measurement, monitoring, reporting, verifying)
- MiQ operates a **Digital Registry** – secure virtual ledger where all MiQ
 - Certificates are held from issuance to retirement
- MiQ collaborates with **trading platforms**



THE HEAT IS ON...

RECENT PROGRESS IN METHANE ACCOUNTABILITY

- COP 28 – Most Oil & Gas companies agreed to slash their methane emissions by 80% by 2030
- EPA established a fine for excess methane emitters - \$900 - \$1500 per ton
- Methane detecting satellites are gathering data and making methane emissions public
- EU Methane Regulations took effect in May 2024 / ASIA implementing guidelines for supply chain carbon intensity
- Utilities leaning in on certified gas



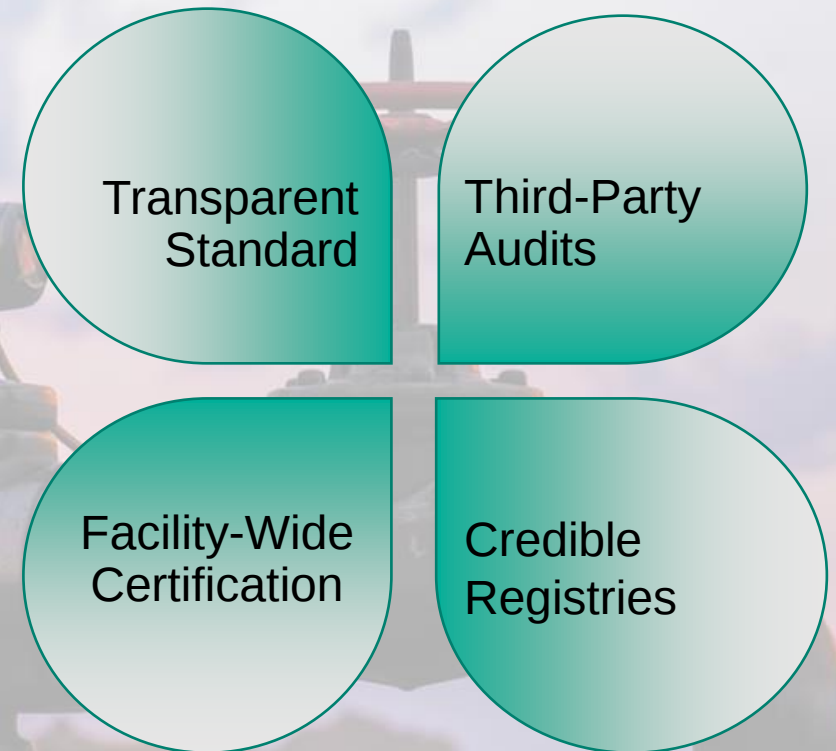
This image shows a methane plume 2 miles (3 kilometers) long that NASA's Earth Surface Mineral Dust Source Investigation mission detected southeast of Carlsbad, New Mexico. Photo: NASA – JPL/CalTech

MiQ Certification is the most credible demonstration of verified emissions

MIQ'S SOLUTION: ADDRESS METHANE EMISSIONS AT SCALE – THIS DECADE

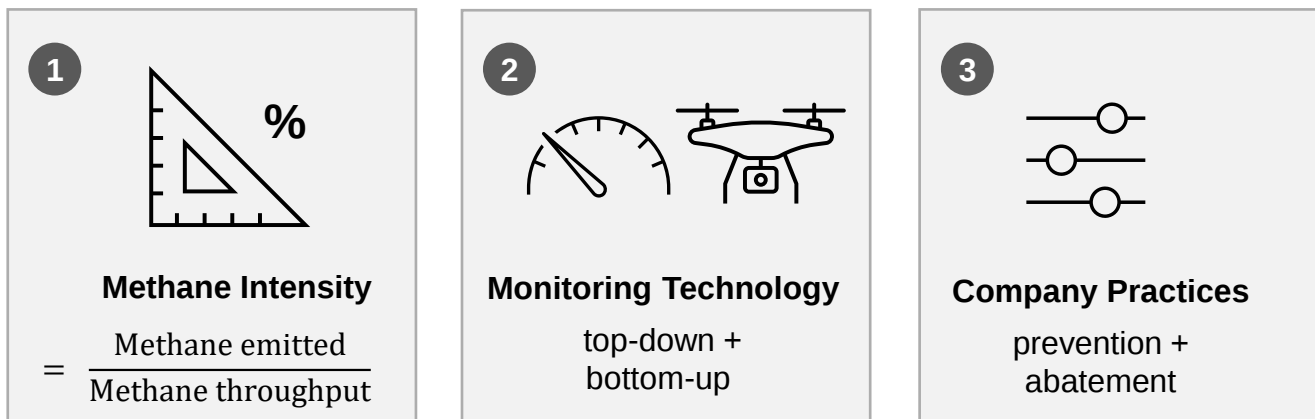
- MiQ has created certified gas to grade oil and gas assets on their methane emissions (grade A to F)
- Independent of
 - Operators
 - Technology providers
 - Auditors of the standard
- Performance Standard
 - Holistic - rewards methane management, mitigation, monitoring, and measurement
- MiQ operates a Digital Registry for tracking certificates and avoiding double counting
- Facility wide certifications to avoid cherry picking of sites

Certification Market Principles



CERTIFIED GAS = METHANE PERFORMANCE STANDARD

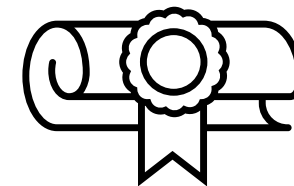
THREE PILLARS TO DETERMINE MIQ GRADE



Third-party (3P) Auditors: audit, verify and report

≤ 0.05%	Quarterly	Stringent	A
≤ 0.10%	Semi-annually	High	B
≤ 0.20%	Semi-annually	Medium	C
≤ 0.50%	Annually *	Mandatory minimum	D
≤ 1.00%	Annually *	Mandatory minimum	E
≤ 2.00%	Annually *	Mandatory minimum	F

1. MiQ certifies at **facility/asset** level -> value chain emissions
2. Audits valid 1 year; monthly & quarterly checks, grade bands
3. OGMP & other protocols embedded
4. MiQ Standard is transparent: www.miq.org
5. Central trusted digital authority: www.miqregistry.org
6. 1 MMBtu produced = 1 certificate > **no double counting**
7. MI attribute on certificate (g/MMBtu, %)
8. Transact in parallel to physical gas sale



CERTIFIED GAS FOR BUYERS

MIQ CERTIFIES OVER 20% OF GAS PRODUCED IN THE USA

EXAMPLES OF PARTICIPATING COMPANIES



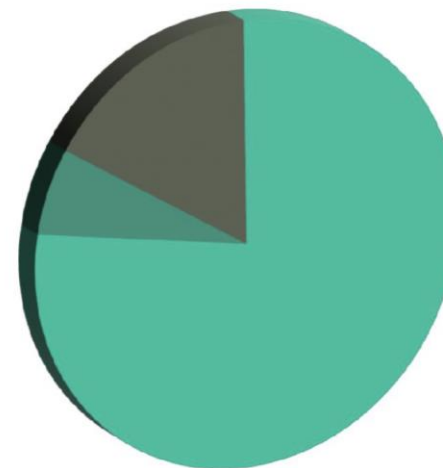
CHESAPEAKE
ENERGY



ExxonMobil



SENECA
RESOURCES
A NATIONAL FUEL GAS COMPANY



MiQ Certified Gas Certificates, by Grade*

Grade A:	78%
Grade B:	6%
Grade C:	16%
Grade D:	0%
Grade E:	0%
Grade F:	0%

*As of December 2023

All certified facilities listed on
<https://www.miqregistry.org/certifications>

WHERE CAN I FIND CERTIFIED GAS?

<https://www.miqregistry.org/certifications>

Certified Facilities

Search:

Facility	Operator	Facility country	Segment	
Appalachia Basin Facilities	XTO Energy Inc.	United States of America	Onshore production	View
Ascent Resources - Utica	Ascent Resources - Utica, LLC	United States of America	Onshore production	View
bpx energy - Eagle Ford	BP America Production Company	United States of America	Onshore production	View
bpx energy - East Texas Basin	BP America Production Company	United States of America	Onshore production	View
bpx energy - Permian				
bpx energy Arkla Basin				
Calyx Energy III, LLC North Arkoma Basin				

Facility Details

Facility	Gulfport Appalachia Basin
Operator	Gulfport Energy Operating Corporation
Facility location	Ohio
Facility country	United States of America
Segment	Onshore production
MiQ Certification Period	October 2023 to September 2024
MiQ auditor	Environmental Standards, Inc.
EO100™ Certification Period	N/A
EO100™ auditor	N/A



BUYING MIQ CERTIFICATES

- CG Hub launched for buying and selling of physical forward contracts in November 2022
- MiQ Certificates to be available on Xpansiv's leading environmental commodities exchange for spot buys Q4 2024



Buyers can access MiQ Certificates on these 3 platforms

THE MIQ DIGITAL REGISTRY

- Precedent & best practice: other certified energy markets (renewable electricity, RNG, biodiesel) rely upon registries.
- Proof of ownership of certificates requires a **digital registry** with **secure ledgers**. Comparable to share registry or bank account.
- The MiQ registry acts as the **central authority** and avoids double counting
- MiQ certificates can trade **bundled** (with gas) or **unbundled** (certificate as standalone)
- The MiQ Registry is NOT a market access platform. The commercial transaction takes place bilaterally, separate from the Registry

	MiQ Digital Registry
Sign on	Free
Yearly Account Fee	Free
Transfer Fee	Free
Retirement Fee for Buyers	\$0.00075 per certificate
Very Low Buyer total cost of Transfer & Retirement	\$3,750 (for 5 Bcf)

HOW ARE CERTIFICATES GENERATED, TRACKED, RETIRED?

Sign up for a free
MiQ account at
MiQRegistry.org

STEP 2

- Operator reports throughput to **registry** each month. 1 cert per MMBtu w/ Facility grade issued to operator's account

Certs
Issued

STEP 4

- Gas is used. Operator claims emissions as Scope 1, or buyer claims emissions as Scope 3.

Attributes
Used

Facility
Graded

Certs
Transacted

Certs
Retired

STEP 1

- Facility undergoes independent 3rd party Audit and receives a **GRADE**, which correlates to **Methane Intensity**. Audit report submitted to **registry**. Certification good for 1 year.

STEP 3

- Operator may transfer certs to marketer or buyer's **registry** account, based on deals or contracts occurring outside registry

STEP 5

- User of gas retires certificates inside **registry** (\$0.00075 per certificate to retire)

CERTIFICATE EXAMPLE

T9M6A7H5 

Account type: **Trading** | Balance: **116 010**

 Transactions History

 Close

Holdings

Facility	Segment	Country of Operation	Operator Name	MiQ Grade	EO100™ Grade	Grade Status	Issue Month	Certificate Region	Quantity
Show ▾	Show ▾	Show all ▾	Show all ▾	Str ▾	Sh ▾	Sh ▾	Shc ▾	Show ▾	
Marcellus #001	Production Onshore	United States of America	Long Loop Main Operator Co LLC	A		Initial audit	January 2022	North America	90 010
North Sea #001	Production Onshore	Norway	TEST OPERATOR	C		Initial audit	March 2021	Europe	26 000

Showing 1 to 2 of 2 entries

Previous **1** Next

Independently Certified Gas Retirement Statement



This Retirement Statement confirms that

100 000

Certificates each representing 1 MMBtu (or 0.293 MWh) of certified natural gas have been Retired for the Beneficiary,

Example End User Inc.

for the purpose of

"2022 consumption at Example End User's industrial complex."

for natural gas consumption located in

North America

These certificates were retired on behalf of the Beneficiary by

ACME Production & Trading LLC

on

06 November 2023 at 11:39:31 UTC

Statement Verification

This statement can be verified for authenticity on the MiQ digital registry. Use the QR code or copy the URL below to download a copy:

<https://demo.miqregistry.dev/pub/certificates/ym2V3PT0i19wxbjcft2xG8/hTBxLdOU7YC1dBQEVy9c=>

Download access code: 7d1c2330



RETIREMENT STATEMENT – PAGE 2

Breakdown of retired certificates



This statement is proof of the secure and unique Retirement of the following Certificates for the named Beneficiary to be reported against consumption in the Certificate Region stated. Certificates are allocated to the named Beneficiary and cannot be further assigned to a third party.

The MiQ Standard and Certification program assures that the methane intensity of the Certified Gas represented by the MiQ certificates included on this Retirement Statement is at or below the level set out in the column 'MiQ Methane Intensity'. Such assurance is provided through a third-party independent audit combining monitoring, abatement measures and reconciliation of both top-down and bottom-up emission calculations for the entire facility. For more details on how the gCH₄/MMBtu methane intensity has been determined, please refer to the Program Guide.

Total Certificates: 100 000

Facility	Operator	Supply chain Segment	Country of Operation*	Issue Month	ED100 Grade	MiQ Grade	MiQ Methane Intensity (gCH ₄ /MMBtu)	Certificate Region	Quantity	Certificate numbers	Status
Test Facility_E		Onshore production	United States of America	December 2022		A	9.5	North America	50 000	0000-0019-0903-1552 - 0000-0019-0908-1551	Retired
Test Facility_E		Onshore production	United States of America	November 2022		A	9.5	North America	50 000	0000-0019-0753-0991 - 0000-0019-0758-0990	Retired

* For the LNG Shipping supply-chain segment, Country of Operation is the country where the LNG was landed.

HOW DO YOU DETERMINE YOUR EMISSION REDUCTIONS?

MiQ-Highwood
Index
(Production)

MiQ Certificate :
Methane Intensity
B-grade Production

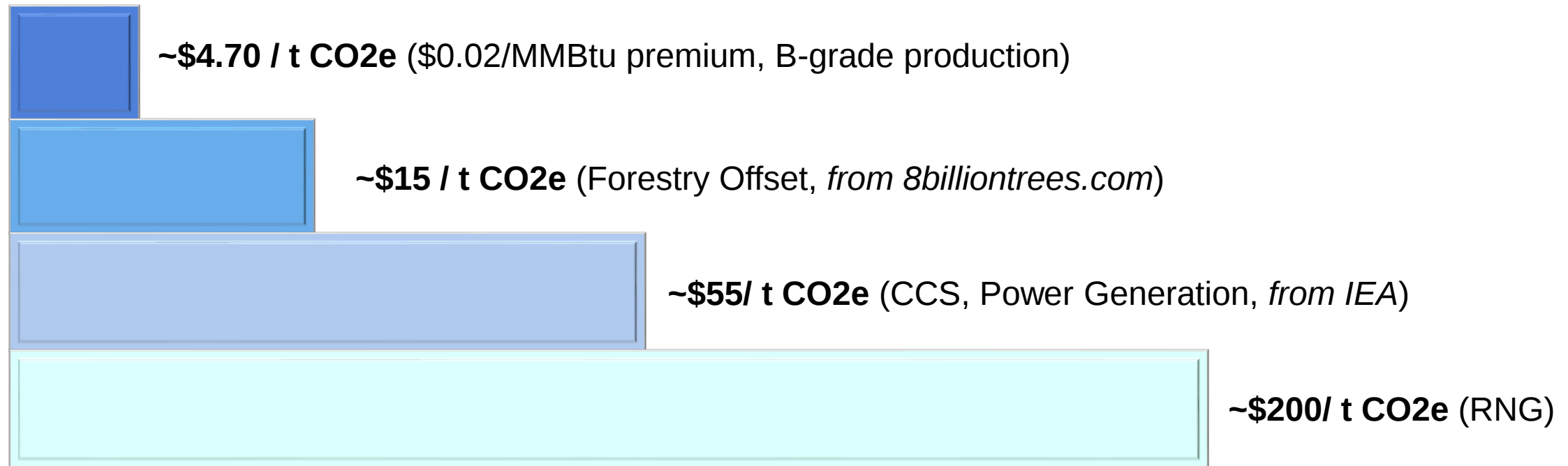
Emission
Reductions

MI	1.0 %*	-	0.1%	=	0.9%
g CH4/MMBtu	174	-	17	=	157
g CO2e/MMBtu	4,852	-	477	=	4,375

*Sherwin et al 2024
Assumptions: 100-yr GWP of 27.9 gCO₂e/gCH₄, HHV: 1.036 MMBtu/Mscf, CH4 Content: 92%, CH4 Density: 0.0192 t/Mscf



CERTIFIED GAS IS COST EFFECTIVE AND CREDIBLE – COMPARISON



Assumptions: Certified gas premium: \$0.02/MMBtu, RNG price: \$15/MMBtu, 100-year GWP for certified gas calculation



MiQ Emissions Calculator - Buyers

MiQ has developed and launched the Gas Buyers Methane Emissions Calculator. The calculator shows natural gas buyers the potential methane emissions reductions from the production segment of purchasing MiQ-certified gas compared to benchmark gas.



 **MiQ Emissions Calculator for Gas Buyers 2.0**

<https://miq.org/miq-emissions-calculator-buyers/>

HOW CAN MESA, ARIZONA TAKE 10,000 CARS A YEAR OFF THE ROAD TODAY?

Annual volume of natural gas in MMBtu	3,318,123
Metric tons of methane emissions – uncertified (per MiQ-Highwood Index @ 1% national avg)	582.0
Metric tons of methane emissions – certified MiQ Grade A ($< 0.05\%$ MI)	29.1
Metric tons of CO ₂ e reduced – assuming 20-year Global Warming Potential	45,614
At 2 cents per MMBtu premium – monthly cost per household	\$0.13
Total yearly cost at 2 cents premium per MMBtu	\$66,362.46



MiQ Emissions Calculator for Gas Buyers 2.0

Production segment only calculator. For full supply chain assessment from well to gate, please contact MiQ. These calculations are approximate and should not be used for emission inventories or formal carbon emissions analysis. For further information, please see 'Information and Terms' below

Certified gas characteristics

Type *

- ☒ Gas contract
☐ Gas-fired power plant
☐ Hydrogen (H2) plant

Contract - Gas Unit

MMBtu (Dth) ▼

Contract - Gas Quantity

3318123

Certificate MiQ Grade (methane intensity %) *

MiQ grade A (< 0.05%) ▼

Price MiQ certs (\$/MMBtu)

0.02 ▼

GHG parameters

- ☒ Benchmark
☐ Custom Reference

Select Benchmark

US National Average Production - MiQ-HW Index (2023) (1.00%) ▼

GWP (1) *

20 year (82.5x) ▼

GHG Equivalency - unit (2)

gasoline-powered cars driven for one year ▼

Display these units

- ☐ MI - gCH₄/MMBtu
☒ MI - gCO₂e/MJ
☐ MI - kgCO₂eq/boe

THE BENCHMARK IS KEY

- What can you compare reductions against?
- Benchmarks must compare "like-for-like" to be meaningful (i.e. measurement-informed assets vs a measurement-informed benchmark)
- The Emissions Calculator provides baselines from the MiQ-Highwood Index – the first measurement-informed, methane intensity for the US
- Bespoke benchmark option available
- Select your global warming potential (GWP) 20-year or 100-year

Emissions Calculator for Gas Buyers 2.0

[Print](#)

Certified Gas

Gas Quantity	3,318,123 MMBtu (Dth)
Certified MiQ grade	MiQ grade A (< 0.05%)
GWP period	20 year (82.5x)
Methane Intensity (MI)	0.05%
	0.7 gCO ₂ e/MJ
Methane Emissions	29.1 MT methane
	2,400.8 MT CO ₂ e

Benchmark - Methane Emissions

Benchmark	US National Average Production - MiQ-HW Index (2023) (1.00%)
	MiQ-Highwood, 2023
	https://miq.org/miq-highwood-index/
Benchmark - MI	1.00%
	13.7 gCO ₂ e/MJ
Benchmark - Methane Emissions	582.0 MT methane

Reduction Methane Emissions vs. Benchmark

Reduction - MI	13.0 gCO ₂ e/MJ
Reduction in %	95%
Reduction - Methane	552.9 MT methane
	45,614 MT CO ₂ e
Reduction equivalent	10,172 gasoline-powered cars driven for one year

Cost Certified Gas

Cost Certificates	0.02 \$/MMBtu
	3,318,123 certificates (MMBtu)
	\$66,362.46
Cost per MT reduced	1.45 \$/MT CO₂e
Cost per household (4)	0.13 \$/month



CALCULATING SCOPE 3 METHANE REDUCTIONS FOR A GAS-FIRED POWER PLANT

Gas volume for 1 week of operation - 1500 MW @ 60% efficiency - 420,000 MWh	1,433,964
Metric tons of methane emissions – uncertified	251.5
Metric tons of methane emissions – certified MiQ Grade A (< 0.05% MI)	12.6
Metric tons of CO2e reduced – assuming 20-year Global Warming Potential	19,709
Assuming 2 cents per MMBtu premium – cost per household	\$0.10
Total cost at 2 cents premium per MMBtu	\$28,679.28
Equivalency in cars taken off the road for 1 year	4,395

COMPARISON TOOL – REDUCTION VS OFFSETS

Compare various Carbon Pricing markets



- **ARBOC's** = California Air Resources Board Carbon Offsets
- **EU ETS** = Emissions Trading System (European cap & trade program)
- **LCFS** = California Low Carbon Fuel Standard
- **Nature Based Carbon Offset** – Projects that protect or restore natural ecosystems

WHERE DO I START?

Step 1

- Sign up on the MiQ Registry at miqregistry.org [miqregistry](https://miqregistry.org)



Step 2

- Contact gas sellers listed on miqregistry.org/certifications – OR -



Step 3

- Sign up on CG Hub at trumarx.com/cg-hub [g-hub](https://trumarx.com/cg-hub)





THANK YOU

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