

STRONGHOLD

# Carbon Capture Initiative and Q3 2023 Earnings

November 2023

# Disclaimer

## Forward-Looking Statements

The information, financial projections and other estimates contained herein contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, and future guidance with respect to the anticipated future performance of the Company and its potential carbon capture initiative. Such financial projection, guidance, and estimates are as to future events and are not to be viewed as facts, and reflect various assumptions of management of the Company concerning the future performance of the Company and are subject to significant business, financial, economic, operating, competitive and other risks and uncertainties and contingencies (many of which are difficult to predict and beyond the control of the Company) that could cause actual results to differ materially from the statements and information included herein. Forward-looking statements may include statements about various risks and uncertainties, including those described under the heading "Risk Factors" in our previously filed Annual Report on Form 10-K, filed on April 3, 2023, and in our subsequently filed Quarterly Reports on Form 10-Q.

In addition, such information, financial projections, guidance and estimates were not prepared with a view to public disclosure or compliance with published guidelines of the SEC, the guidelines established by the American Institute of Certified Public Accountants or U.S. generally accepted accounting principles ("GAAP"). Accordingly, although the Company's management believes the financial projections, guidance and estimates contained herein represent a reasonable estimate of the Company's projected financial condition and results of operations based on assumptions that the Company's management believes to be reasonable at the time such estimates are made and at the time the related financial projections and estimates are disclosed, there can be no assurance as to the reliability or correctness of such information, financial projections and estimates, nor should any assurances be inferred, and actual results may vary materially from those projected.

## Section 45Q

In January 2021, the IRS issued final regulations under Section 45Q of the Internal Revenue Code, which provides a tax credit for qualified CO<sub>2</sub> that is captured using carbon capture equipment and disposed of in secure geological storage (in the event of direct air capture that results in secure geological storage, credits are valued at \$180 per ton of CO<sub>2</sub> captured) or utilized in a manner that satisfies a series of regulatory requirements (in the event of direct air capture that results in utilization, credits are valued at \$130 per ton of CO<sub>2</sub> captured). We may benefit from Section 45Q tax credits only if we satisfy the applicable statutory and regulatory requirements, including but not limited to compliance with wage and apprenticeship requirements to receive the \$180/ton tax credits, and we cannot make any assurances that we will be successful in satisfying such requirements or otherwise qualifying for or obtaining the Section 45Q tax credits currently available or that we will be able to effectively benefit from such tax credits. We are currently exploring whether our carbon capture initiatives discussed herein would be able to qualify for any 45Q tax credit. It is not entirely clear whether we will be able to meet any required statutory and regulatory requirements, and qualification for any amount of 45Q credit may not be feasible with our currently planned direct air capture initiative. Additionally, the availability of Section 45Q tax credits may be reduced, modified or eliminated as a matter of legislative or regulatory policy. Any such reduction, modification or elimination of Section 45Q tax credits, or our inability to otherwise benefit from Section 45Q tax credits, could materially reduce our ability to develop and monetize our carbon capture program. Any of these factors may adversely impact our business, results of operations and financial condition.

## Non-GAAP Measures

This presentation includes financial measures that are not presented in accordance with GAAP. While management believes such non-GAAP measures are useful, it is not a measure of our financial performance under GAAP and should not be considered in isolation or as an alternative to any measure of such performance derived in accordance with GAAP. These non-GAAP measures have limitations as analytical tools and you should not consider them in isolation or as substitutes for analysis of our results as reported under GAAP. The reconciliations for non-GAAP figures to applicable GAAP measures are included in the Appendix.

We have not reconciled non-GAAP forward-looking measures, including EBITDA guidance, to their corresponding GAAP measures due to the high variability and difficulty in making accurate forecasts and projections, particularly with respect to the price of Bitcoin, Bitcoin network hash rate, electricity prices, plant outages, power input costs, and the various assumptions underlying our proposed carbon capture initiative discussed herein, which are difficult to predict and subject to change. Accordingly, such reconciliations of non-GAAP forward-looking measures are not available without unreasonable effort.





## Third-Party Information

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See Key Assumptions on page 24

# Stronghold at a Glance

The only environmentally beneficial and vertically integrated public Bitcoin mining company

NASDAQ Ticker Symbol	SDIG		Owner of two mining waste reclamation facilities: Scrubgrass and Panther Creek
Share Price	\$3.89		165 MW of net power generation capacity
Bitcoin Mined (Q3 2023)	~620		Nearly 1,700,000 tons of mining waste removed from the environment since beginning of 2022
Deployed Hash Rate Capacity	4.0 EH/s		>40,000 miners delivered and funded ~25 MW of data center equipment inventory

Note: all data as of 11/10/23 unless otherwise noted; all figures approximated

# Unlocking Significant Value From Substantial Asset Base

## Optimizing Bitcoin Mining Operations



With 4 EH/s of current hash rate capacity, every 1% of incremental uptime could yield **over \$500k** of annual cash flow<sup>1</sup>; potential for 5-10% uptime gain in near future

- Entered into agreement with best-in-class, established operator, Frontier Mining, to manage data centers and enhance Bitcoin mining operations in October 2023
  - Observing improvements in miner performance and process efficiency
  - Agreement terms incentivize Frontier and include fee adjustments based on Bitcoin mining economics
- Continuing to evaluate prudent hash rate growth into the April 2024 halving: potential third data center (discussions ongoing) vs. selective high-grading of miners at current sites (no additional capex committed currently)

## Capturing CO<sub>2</sub> with Ash Byproduct



Scrubgrass ash can capture CO<sub>2</sub> at up to **12%** by starting weight based on third-party lab tests

- **Developed first-generation direct air capture (“DAC”) technology** with partners to facilitate carbonation, with initial unit deployed at Scrubgrass

1. Assumes a \$0.075 hash price (see Appendix for information about hash price and how it is calculated), \$42.50/MWh cost of power, and 34 J/T average miner efficiency



# Stronghold Carbon Capture

# The New Carbon Market

Private markets and the federal government have developed significant incentives for those who capture carbon and/or reduce carbon emissions

Projects that capture carbon are eligible to sell carbon credits **and** may be suitable to receive 45Q tax credits



## Voluntary Carbon Market

- Businesses and organizations purchase credits from carbon capture projects to offset their emissions
- Registries verify environmental benefits, methodologies, and viability of projects (effectively accrediting the associated credits)
- Credits validated by the most established registries (which typically have the most thorough registration processes) generally trade at premium to other credits



## Inflation Reduction Act (“IRA”)<sup>1</sup>

- Contains ~\$500 billion in new spending and tax incentives primarily focused on clean energy and healthcare
- Nearly \$400 billion in spending and incentives target climate and clean energy initiatives
- Expands IRS Section 45Q incentives, which can be realized as direct-pay tax credits for qualifying carbon capture projects; credits for direct air capture can reach \$180 per ton of CO<sub>2</sub> captured

1. See: “The Inflation Reduction Act: Here’s what’s in it.” *McKinsey & Company*, 24 Oct. 2022, <https://www.mckinsey.com/industries/public-sector/our-insights/the-inflation-reduction-act-heres-whats-in-it>



## Stronghold's Beneficial Use Ash Can Capture Carbon

### Large-Scale CO<sub>2</sub> Removal

Potential to capture up to  
**~100k tons of CO<sub>2</sub>** from  
ambient air annually  
by end of 2024<sup>1</sup>

### Financially Transformative

Potential to drive up to **~\$30mm**  
of incremental annual EBITDA  
and reduce Stronghold's  
net cost of power to  
as low as **~\$16/MWh**<sup>2</sup>

### Low Technology Risk

Carbon capture process is  
largely a combination of  
basic chemistry and airflow

1. See inputs and assumptions on page 13

2. See inputs and assumptions on pages 14-15; assumes receipt of 45Q tax credits; see Disclaimer page for details and risks associated with 45Q; it is currently uncertain whether we will be successful in monetizing our carbon program

# Stronghold owns two circulating fluidized bed (“CFB”) mining waste reclamation and power generation facilities:

## Scrubgrass

(~85 MW of net output capacity)



## Panther Creek

(~80 MW of net output capacity)

## Our Business Model

Partner with PA DEP to reclaim land, and generate power (under a Title V EPA permit) that is used to mine Bitcoin and supply power to the PJM grid

Note: See Appendix for more information on mining waste



Primary source of energy for these facilities is mining waste (coal refuse), sourced from the reclamation of some of the **840+ mining waste piles** littered across Pennsylvania, an unfortunate legacy byproduct of centuries of coal mining



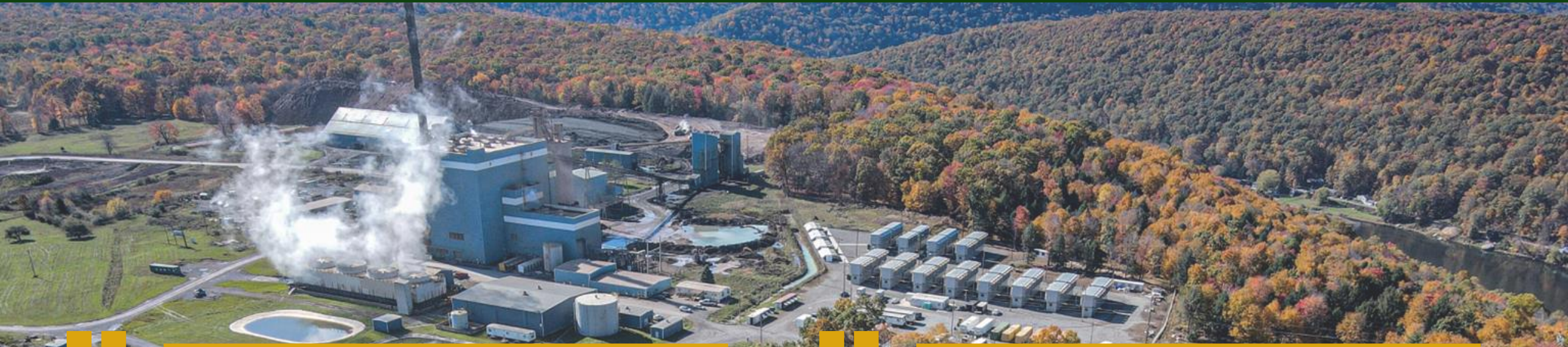
CFB power generation process removes this harmful waste from the environment - reducing water pollution, land pollution, and air emissions from mining waste piles - and converts it into electricity (the primary product) and beneficial use ash (a byproduct)



CFB fuel mix neutralizes sulfur dioxide (SO<sub>2</sub>) with limestone and creates a calcium-rich, basic (high-PH) ash, most of which is currently returned to mining waste piles to reclaim land, facilitating revegetation



# Third-Party Studies Support That Mining-Waste-to-Power Activities Are Net **Carbon Negative**, Reducing Net GHG Emissions by **50-80%**<sup>1</sup>



The coal refuse reclamation-to-energy facilities in Pennsylvania (PA) and West Virginia (WV) alone reduce the equivalent net GHG emissions that would otherwise be emitted from the same amount of coal refuse by over 20 million tons of CO<sub>2</sub> [equivalent] in a single year.<sup>2</sup>



Each ton of coal refuse is expected to produce GHG emissions between 2.43 and 6.44 tons CO<sub>2</sub>, [equivalent] with a net reduction of between 1.16 and 5.17 tons CO<sub>2</sub> [equivalent] per ton of coal refuse reclaimed by the coal refuse [reclamation-to-energy] industry.<sup>1</sup>



1. See: Romero, Carlos (Dr). "Comparison of the Impact on Greenhouse Gas Emissions Between Unabated Coal Refuse Piles and Reclamation-to-Energy Power Plants." *Energy Research Center*, Lehigh University, 23 Jan. 2023, p. 3, <https://strongholddigitalmining.com/wp-content/uploads/2023/11/Lehigh-University-Jan.-2023.pdf>

2. See: Fraser, Robert G. (QEP), and Patrick Fennell (PE). "Net Air Emission Benefits from the Remediation of Abandoned Coal Refuse Piles." *TRC Environmental Inc.*, March 2023, p. 2, <https://strongholddigitalmining.com/wp-content/uploads/2023/11/TRC-Environmental-Inc.-March-2023.pdf>

# Introducing Stronghold Carbon Capture



Third-party lab results over last 4 months, utilizing 3 separate testing methods, indicate that **our ash can capture CO<sub>2</sub> at a capacity of up to 12% by weight of starting ash**<sup>1</sup>



Worked with construction, design, and engineering partners to develop **direct air capture (“DAC”)** technology that utilizes the stack effect to drive air through ash

First DAC unit installed at Scrubgrass on Nov. 10<sup>th</sup>

1. Actual CO<sub>2</sub> absorption may vary, including by site, type of ash, arrangement of ash, and weather conditions

# Complementary, Capital-Efficient, and Near-Term Direct Air Capture Opportunity

Scrubgrass and Panther Creek estimated to produce **~800-900k metric tons of beneficial use ash** per year when operating at baseload capacity<sup>1</sup>

**Ash contains reactive calcium oxide (CaO), which bonds with CO<sub>2</sub> to form calcium carbonate (CaCO<sub>3</sub>), effectively pulling CO<sub>2</sub> out of the air – this bond is permanent and geologically stable<sup>2</sup>**

## Engaged CO<sub>2</sub> mineralization expert [Karbonetiq](#) in June 2023 to explore carbon capture opportunities with our ash

- Conducted numerous third-party lab tests with ash from Scrubgrass – results demonstrate that ash can capture up to 12% of its weight in CO<sub>2</sub> from ambient air
- Designed [Karbolith™](#) direct air capture equipment, which drives airflow through ash to facilitate carbonation
- Installed first [Karbolith™](#) at Scrubgrass on November 10<sup>th</sup>, with <\$100k equipment cost
- Potential for Best-in-class capital efficiency, currently estimated at \$50-125 per ton of annual CO<sub>2</sub> capture capacity<sup>3</sup>

## Engaged environmental consulting firm [Carbonomics](#) in September 2023 to advise on carbon capture verification, documentation, and listing our project on a carbon registry to monetize CO<sub>2</sub> removals in private carbon markets

- Identified [Puro](#) Registry's existing Carbonated Materials methodology as applicable for our project
- Submitted concept paper to [Puro](#) for initial feedback in October 2023; planning to submit formal Project Design Document with aim of having project listed by Q1 2024
- Planning to use third party certified labs to measure and verify CO<sub>2</sub> removals using standard TGA-MS and QXRD methods starting with Phase I

1. Ash comprises both bottom ash and fly ash; Stronghold is in the process of determining the best mixture of bottom ash and fly ash for capture purposes, but both have been proven to capture carbon; historically, there have been times when the plants did not operate at baseload capacity utilization  
2. Ash may release CO<sub>2</sub> in the remote event that it is exposed to extreme heat (1,500 degrees Fahrenheit) or hydrochloric acid  
3. Reflects management's current estimates, subject to potentially significant change based on labor requirements, construction and materials costs, verification equipment, and number of Karboliths required, among other factors

# Process Expected to Dramatically Increase CO<sub>2</sub> Removals

## Status Quo Process

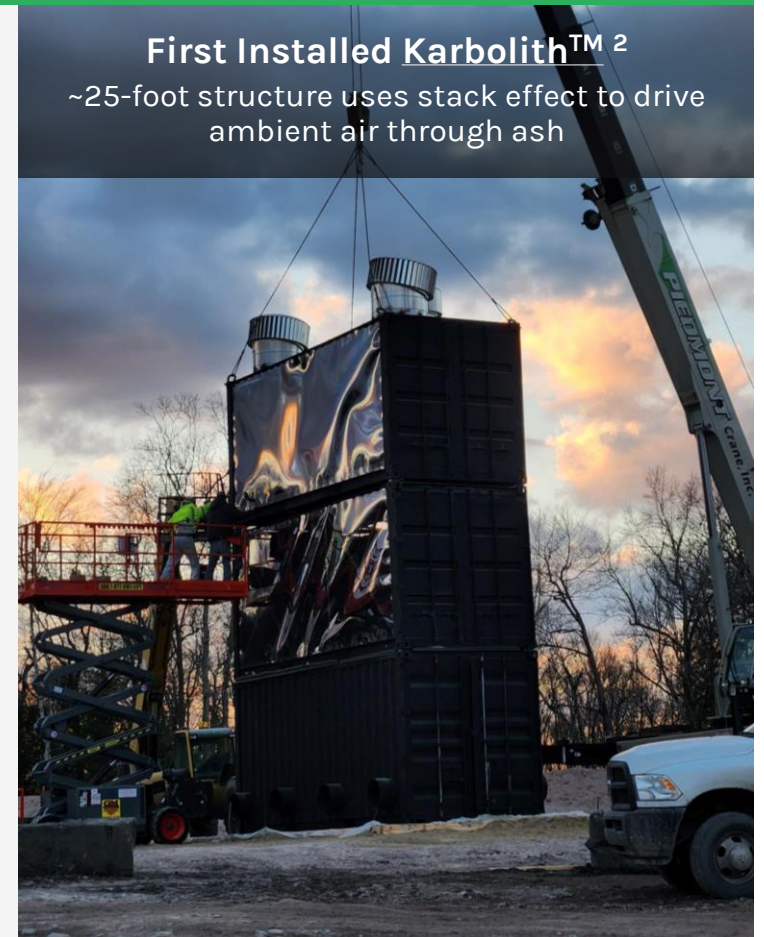
- 1 Ash is dispensed from facilities
- 2 Most ash is promptly transported back to mining waste piles, replacing the waste as it is extracted, until fully reclaimed
- 3 Ash is packed into ground and covered with soil to revegetate land

**Note:** Given ash's limited exposure to air, little carbonation occurs



## Expected Process with Carbon Capture

- 1 Ash is dispensed from facilities
- 2 Ash is immediately directed to a field and methodically spread out among Karboliths™ to maximize aeration
- 3 Karboliths™ drive airflow through ash, facilitating permanent and secure carbonation
- 4 After carbonation has occurred, CO<sub>2</sub> removals are quantified, and most ash is transported back to mining waste piles
- 5 Ash is packed into ground and covered with soil to revegetate land (working on alternative uses as well)
- 6 CO<sub>2</sub> is permanently and securely stored<sup>1</sup>



1. Ash may release CO<sub>2</sub> in the remote event that it is exposed to extreme heat (1,500 degrees Fahrenheit) or hydrochloric acid  
2. Design subject to change based on results from initial units; contemplating larger structure (up to ~50 feet) to evaluate how size of the unit impacts carbon capture results

# Potential to Be Among World's Largest DAC Projects & The Largest Announced U.S. DAC Project Operational Before 2025<sup>1</sup>

**~800-900k tons**

of ash produced per year<sup>2</sup>

**Up to 12%**

CO<sub>2</sub> capture capacity by weight of starting ash<sup>3</sup>

▼

**Implies up to ~100k tons of CO<sub>2</sub> captured per year**

### Two Potential Income Streams

**~\$130-190/ton**

Voluntary CO<sub>2</sub> removal certificate pricing<sup>4</sup>

▼

Implies **~\$13-19mm** in annual proceeds from carbon credit sales (at 100k tons of CO<sub>2</sub>)

**\$180/ton**

45Q DAC tax credits (project intended to qualify)<sup>5,6</sup>

▼

Implies **~\$18mm** in addl. annual proceeds (at 100k tons of CO<sub>2</sub>), potential to occur by 2025/26

## U.S. DAC Projects with First Operation Before 2030<sup>1</sup>

#	Project Name	Partners	First Operation Year	Announced Capacity (000s of Tons of CO <sub>2</sub> per Year)
1	Project Bison (WY) Phase 4	CarbonCapture, Frontier Carbon Solutions	2028	4,000
2	HIF USA eFuels Matagorda County (TX)	HIF USA	2026	2,200
3	Oxy CE Kleberg County DAC plants (TX)	Occidental, 1PointFive, Carbon Engineering	2025	1,000
4	Project Bison (WY) Phase 3	CarbonCapture, Frontier Carbon Solutions	2028	800
5	DAC-1 Ector County (TX) train 1	Occidental, 1PointFive, Carbon Engineering	2025	500
6	DAC-1 Ector County (TX) train 2	Occidental, 1PointFive, Carbon Engineering	2026	500
7	Project Bison (WY) Phase 2	CarbonCapture, Frontier Carbon Solutions	2026	200
8	<b>Stronghold Carbon Capture<sup>7</sup></b>	<b>Stronghold Digital Mining</b>	<b>2024</b>	<b>60-100</b>
9	Project Bison (WY) Phase 1	CarbonCapture, Frontier Carbon Solutions	2024	10
10	TBD <sup>8</sup>			

1. See: *CCUS Projects Explorer*. IEA, 2023, <https://www.iea.org/data-and-statistics/data-tools/ccus-projects-explorer>  
 2. Tons produced by Scrubgrass and Panther when operating at baseload capacity, inclusive of fly ash and bottom ash  
 3. Based on extrapolation of Scrubgrass ash lab results; CO<sub>2</sub> absorption may vary, including by site, type of ash, arrangement of ash, and weather conditions  
 4. Approximate 2023 range for Puro's CO<sub>2</sub> Removal Certificate Weighted Index, quoted in Euros; assumes 1.07 USD:EUR

5. Subject to adjustment based on lifecycle analysis  
 6. Qualification at this amount requires secure geological storage based on current 45Q requirements; see Disclaimer page for details and risks associated with 45Q  
 7. We expect to achieve our target capture capacity by the end of 2024  
 8. No other projects included in IEA database fit parameters and have announced target CO<sub>2</sub> capture capacities

# Carbon Capture Represents a Compelling Value Proposition

Potential to capture ~60-100k tons of CO<sub>2</sub> annually, which could drive **transformational EBITDA uplift** of ~\$13-31mm annually with 45Q tax credits, or ~\$3-14mm without 45Q tax credits <sup>1,2,4</sup>

## Key variables:

- Quantity of CO<sub>2</sub> captured driven by amount of ash processed, and timing thereof, and ash-CO<sub>2</sub> absorption capacity
- Price of CO<sub>2</sub> removal certificates based on Puro's CO<sub>2</sub> Removal Certificate Weighted Index Family, which has trended between \$130 and \$190 in 2023 <sup>3</sup>
- 45Q tax credits shown for DAC sequestration at \$180/ton <sup>4</sup>

## Illustrative Tons of CO<sub>2</sub> Captured Annually

		CO <sub>2</sub> Captured % of Starting Ash Weight		
		8.0%	10.0%	12.0%
Tons of Ash Utilized per Year	700,000	56,000	70,000	84,000
	800,000	64,000	80,000	96,000
	900,000	72,000	90,000	108,000
	1,000,000	80,000	100,000	120,000

- Assumes 10% of carbon credit proceeds and 5% of 45Q tax credit proceeds paid out in the form of fees and royalties, annual fixed opex of \$1.5mm, and variable opex of \$30 per ton of CO<sub>2</sub> captured; see Disclaimer page for details and risks associated with 45Q
- If we qualify for 45Q tax credits, it is unlikely that we receive such credits until 2025 or 2026 (however, a three-year lookback applies); we expect that we will begin selling some quantum of voluntary carbon credits in 2024 and in earnest by 2025
- Puro's CO<sub>2</sub> Removal Certificate Weighted Index Family is quoted in Euros; conversion based on 1.07 USD:EUR exchange rate; such pricing may change in the future, including due to entry of additional market participants; there are also additional requirements that must be satisfied in order to be listed, and we cannot make any assurance we will be able to do so or, even if we do, to maintain compliance with such additional requirements going forward
- We are exploring our ability to qualify for 45Q tax credits; see Disclaimer page for details and risks associated with 45Q

## Illustrative EBITDA Uplift (\$mm) <sup>1,2,4</sup>

Assumes Receipt of Voluntary Credits and \$180/ton 45Q Tax Credits		Price of CO <sub>2</sub> Removal Certificates (\$/ton)				
		\$120	\$140	\$160	\$180	\$200
Tons of CO <sub>2</sub> Captured per Year	60,000	\$13	\$15	\$16	\$17	\$18
	70,000	\$16	\$17	\$18	\$20	\$21
	80,000	\$18	\$20	\$21	\$23	\$24
	90,000	\$21	\$23	\$24	\$26	\$27
	100,000	\$23	\$25	\$27	\$29	\$31

Assumes Receipt of Voluntary Credits Only		Price of CO <sub>2</sub> Removal Certificates (\$/ton)				
		\$120	\$140	\$160	\$180	\$200
Tons of CO <sub>2</sub> Captured per Year	60,000	\$3	\$4	\$5	\$6	\$8
	70,000	\$4	\$5	\$6	\$8	\$9
	80,000	\$5	\$6	\$8	\$9	\$11
	90,000	\$6	\$7	\$9	\$10	\$12
	100,000	\$6	\$8	\$10	\$12	\$14

# Significant Potential Benefit to Stronghold's Net Cost of Power

**EBITDA Uplift = Net Cost of Power Reduction because ash is byproduct of power generation**

- Potential new income from carbon capture would improve the economics of our existing business
- Carbon capture has potential to drive net cost of generating power to less than \$20/MWh (over 50% reduction from current guidance of \$40-45/MWh) in the event that we qualify for 45Q tax credits<sup>1,2,3</sup>

## Illustrative Impact on Net Cost of Power<sup>1,2,3</sup>

Assumes 80,000 Tons of CO<sub>2</sub> Captured per Year

Net Cost of Power Guidance Midpoint (\$/MWh)		\$42.50
CO <sub>2</sub> Removal Credits		\$160
45Q Tax Credits		\$180
Gross Revenue (\$ / ton of CO <sub>2</sub> )		\$340
<b>Gross Revenue (\$mm)</b>		<b>\$27</b>
(-) Fees, Royalty, Opex (\$mm)		(\$6)
<b>Implied EBITDA (\$mm)</b>		<b>\$21</b>
(/) Illustrative MWh (130 MW net output)		1,138,800
<b>Implied Net Cost of Power Reduction (\$/MWh)</b>		<b>\$19</b>
<b>Illustrative Pro Forma Net Cost of Power (\$/MWh)</b>		<b>\$24</b>

1. We are exploring our ability to qualify for 45Q tax credits; see Disclaimer page for details and risks associated with 45Q
2. Assumes 10% of carbon credit proceeds and 5% of 45Q tax credit proceeds paid out for fees and royalties, annual fixed opex of \$1.5mm, variable opex of \$30 per ton of CO<sub>2</sub>, and 130 MW of average net power output
3. If we qualify for 45Q tax credits, it is unlikely that we receive such credits until 2025 or 2026 (however, a three-year lookback applies); we expect that we will begin selling some quantum of voluntary carbon credits in 2024 and in earnest by 2025

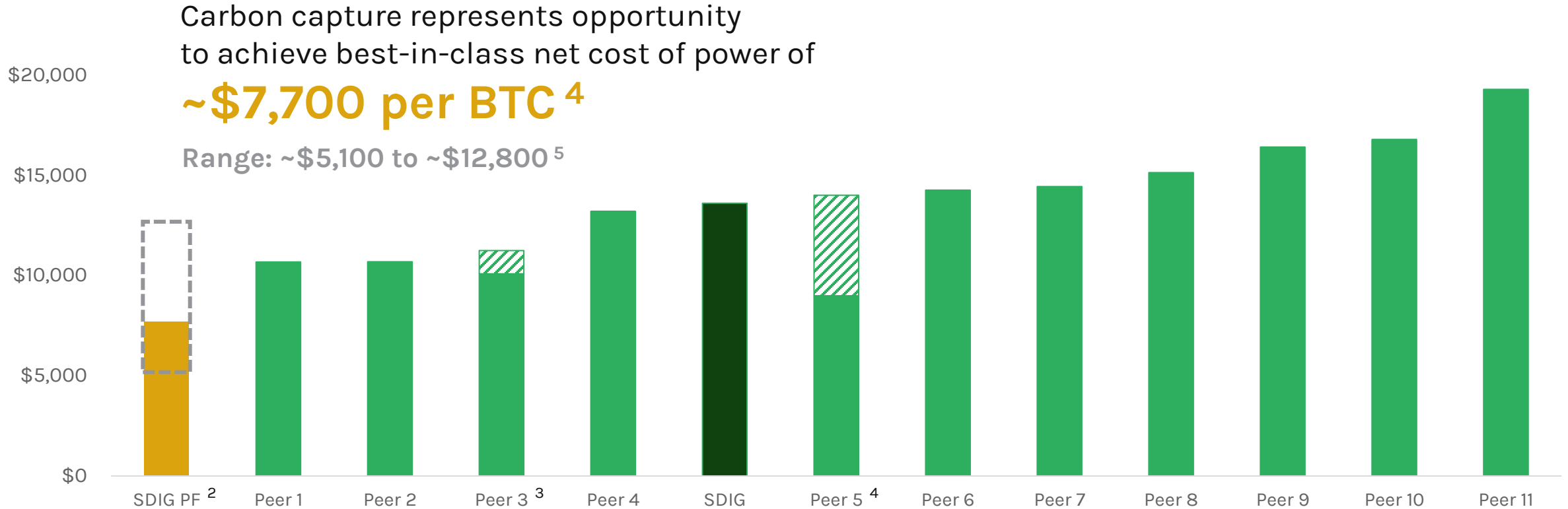
## Illustrative Pro Forma Net Cost of Power (\$/MWh)<sup>1,2,3</sup>

Assumes Receipt of Voluntary Credits and \$180/ton 45Q Tax Credits		Price of CO <sub>2</sub> Removal Certificates (\$/ton)				
		\$120	\$140	\$160	\$180	\$200
Tons of CO <sub>2</sub> Captured per Year	60,000	\$31	\$30	\$29	\$28	\$27
	70,000	\$29	\$27	\$26	\$25	\$24
	80,000	\$26	\$25	\$24	\$23	\$21
	90,000	\$24	\$23	\$21	\$20	\$18
	100,000	\$22	\$20	\$19	\$17	\$16

Assumes Receipt of Voluntary Credits Only		Price of CO <sub>2</sub> Removal Certificates (\$/ton)				
		\$120	\$140	\$160	\$180	\$200
Tons of CO <sub>2</sub> Captured per Year	60,000	\$40	\$39	\$38	\$37	\$36
	70,000	\$39	\$38	\$37	\$36	\$35
	80,000	\$38	\$37	\$36	\$35	\$33
	90,000	\$38	\$36	\$35	\$33	\$32
	100,000	\$37	\$35	\$34	\$32	\$31

# Compelling Cost of Power Compared to Bitcoin Mining Peers

## Standardized Electricity/Hosting Cost per Coin<sup>1</sup>



1. Q1 2024 estimated costs based on equity research report dated 10/9/23, which assumes network hash rate of 400 EH/s; peers include CLSK, RIOT, WULF, IREN, CIFR, HUT, BTDR, BITF, ARGO, MARA, BTBT

2. SDIG PF adjusted for carbon capture (based on page 15)

3. Peer 3 adjusted to reflect 2024E cost of power provided by this company

4. Peer 5 adjusted to exclude sales of electricity

5. Represents a PF net cost of power of ~\$24/MWh, which assumes 100k tons of CO<sub>2</sub> captured per year, \$160/ton price of CO<sub>2</sub> removal certificates, and qualification for 45Q DAC tax credits (see page 15 for additional assumptions)

6. Represents a range of ~\$16/MWh to ~\$40/MWh for net cost of power, per page 15





# Appendix

Mining Waste Overview

# Mining Waste

## ■ A Widely Ignored Environmental Disaster

**Mining waste is the disregarded byproduct of centuries of coal mining**

Brought up from underground and left on the surface during mining process, exposing it to the atmosphere and placing it above the water table





There are over **840** toxic mining waste piles in Pennsylvania, and these large mountains of waste pollute the land, water, and air

Pennsylvania mining communities were instrumental in building America



**The aftermath:** these communities were stripped of their natural resources and jobs and left with this toxic waste in their backyards



If left alone, these piles emit CO<sub>2</sub>, particulates, and volatile organic compounds (benzene, toluene, ethylbenzene, xylenes, hexane, cyclohexane, naphthalene, and acrolein) into the atmosphere<sup>1</sup>



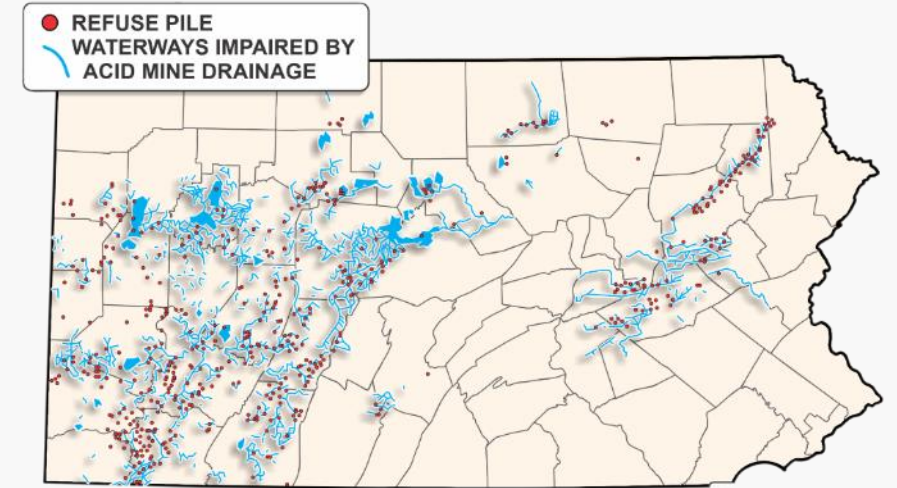
Piles spontaneously combust, releasing more harmful emissions – Pennsylvania DEP estimated that ~40 piles were burning continually in 2020<sup>2</sup>



Acid mine drainage from mining waste piles is one of the largest sources of water pollution in Pennsylvania

1. See: "Coal Refuse Whitepaper." *ARIPPA*, p. 5, [http://arippa.org/wp-content/uploads/2018/12/ARIPPA-Coal-Refuse-Whitepaper-with-Photos-10\\_05\\_15.pdf](http://arippa.org/wp-content/uploads/2018/12/ARIPPA-Coal-Refuse-Whitepaper-with-Photos-10_05_15.pdf)  
2. See: Prepared Testimony of Patrick McDonnell, Secretary, Pennsylvania Department of Environmental Protection, before the Joint Legislative Air and Water Pollution Control and Conservation Committee, 3 Feb. 2020, p. 1, [https://files.dep.state.pa.us/aboutdep/Testimony/2020/2020.02.03\\_JLCC\\_Waste\\_Coal\\_Hearing\\_DEP\\_Testimony.pdf](https://files.dep.state.pa.us/aboutdep/Testimony/2020/2020.02.03_JLCC_Waste_Coal_Hearing_DEP_Testimony.pdf)

Over 5,500  
miles of waterways impaired<sup>1</sup>



- Acid mine drainage from mining waste piles is among the 2 largest known pollutants of waterways in Pennsylvania<sup>1</sup>
- Causes rivers to run orange
- Highly detrimental to aquatic life
- Problem is severe and widespread and threatens water supply downstream, with all impacted streams within or extending to all major river basins in Pennsylvania, which ultimately extend to the Chesapeake Bay, Delaware River, Ohio, Mississippi, and Gulf of Mexico watersheds

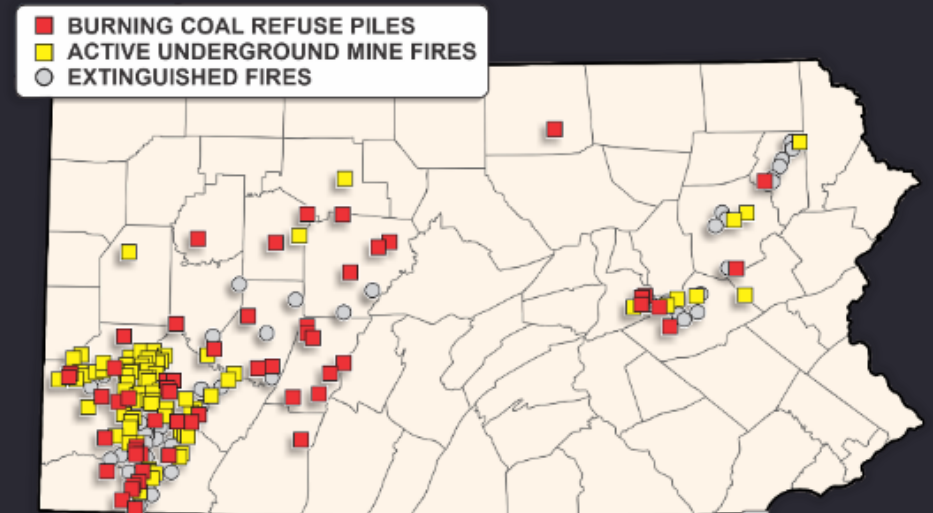
1. See: "2022 Pennsylvania Integrated Water Quality Report." *Pennsylvania Department of Environmental Protection*, 2022, <https://storymaps.arcgis.com/stories/b9746eec807f48d99decd3a583eede12>



All mining waste piles have burned, are burning, or are likely to burn... unless they are reclaimed

1. See: "Coal Refuse Whitepaper." *ARIPPA*, p. 5, [http://arippa.org/wp-content/uploads/2018/12/ARIPPA-Coal-Refuse-Whitepaper-with-Photos-10\\_05\\_15.pdf](http://arippa.org/wp-content/uploads/2018/12/ARIPPA-Coal-Refuse-Whitepaper-with-Photos-10_05_15.pdf)
2. Estimates provided by the Pennsylvania DEP in 2016
3. See: "Economic and Environmental Analysis of Pennsylvania's Coal Refuse Industry." *Econsult Solutions, Inc.*, 8 Sep. 2016, p. 13, <https://www.congress.gov/116/meeting/house/110202/witnesses/HHRG-116-1106-Wstate-HughesR-20191114-SD017.pdf>

- ⚡ Piles spontaneously combust through oxidation and lightning strikes
- 📄 Multiple large piles have burned for decades
- ☠️ When burning, piles release toxic, uncontrolled emissions into atmosphere: hydrogen sulfide, sulfur dioxide, ammonia, oxides of nitrogen, particulates, carbon monoxide, and CO<sub>2</sub><sup>1</sup>
- 🔥 Estimated that nearly 7 million tons of mining waste burn each year in Pennsylvania in unintended, uncontrolled fires, releasing ~9 million tons of CO<sub>2</sub> and numerous other air pollutants without any emissions controls<sup>2,3</sup>



# Mining Waste Reclamation Is the Foundation of Our Business

BEFORE



AFTER



## Reclamation Process

1 Remove toxic mining waste from environment

2 Generate energy from mining waste through highly specialized process that can eliminate most harmful emissions:

~90% of NO<sub>x</sub> emissions

~98% of SO<sub>2</sub> emissions

~99.9% of particle

~99.9% of mercury

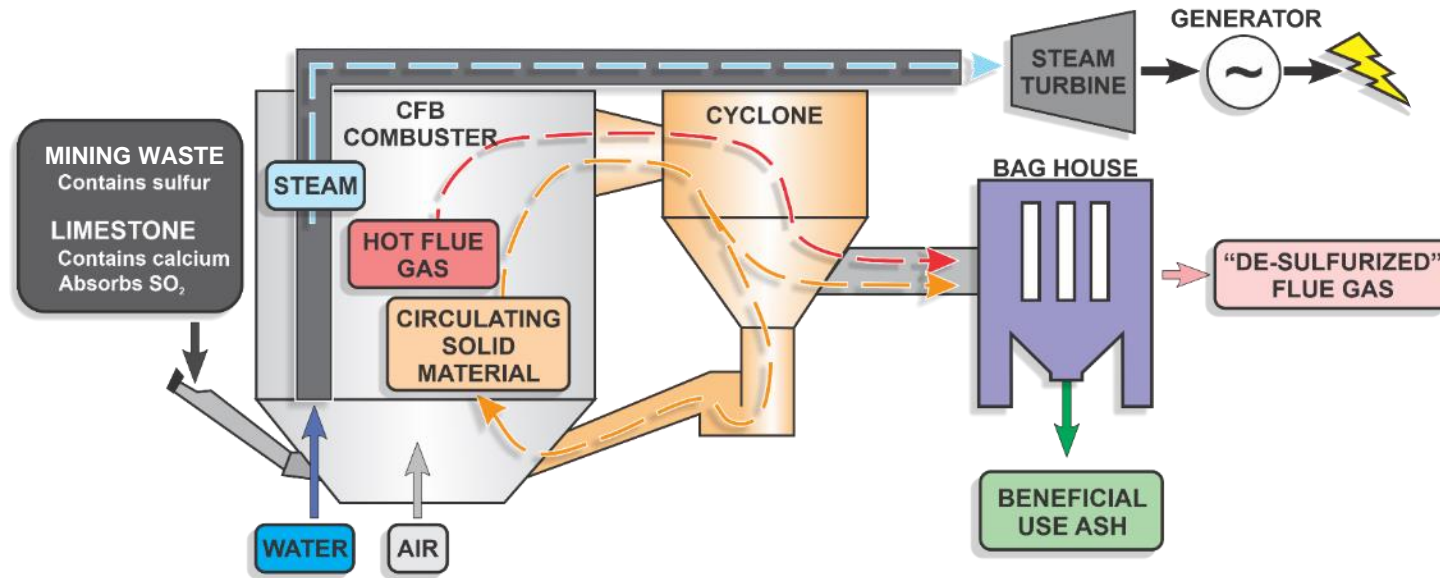
3 Utilize ash byproduct in reclamation and carbon capture projects

We believe that power generation with CFB facilities is the only practical way to solve Pennsylvania's toxic mining waste problem, and Stronghold has already reclaimed over **1,050 acres** of previously unusable land.

CFB facilities were purpose-built for Pennsylvania to solve mining waste problem

- At the time, construction was only economically feasible through above-market power purchase agreements
- Today, process has bipartisan support in Pennsylvania - we receive alternative energy credits and waste coal tax credits to perform this vital work
- Operate at the direction of and in partnership with Pennsylvania DEP to reclaim mining waste piles

# CFB Power Generation Process



Using **CFB facilities** is only way to generate power with low-BTU toxic mining waste

- Traditional thermal coal has ~12,000 BTU/lb heat content; mining waste has ~5,500 BTU/lb heat content
- Pushing air through circulating mining waste effectively fluidizes material and enables combustion

**Limestone** added to feedstock to mitigate SO<sub>2</sub> emissions (calcium in limestone absorbs sulfur)

Resulting ash byproduct is a beneficial use ash – it is basic and a certified liming agent

## INPUTS

Mining Waste, Limestone



## OUTPUTS

Electricity (Product)

Beneficial Use Ash (Byproduct)

### Beneficial Use Ash

Currently, majority of ash is returned to mining waste piles to facilitate reclamation

- Basic nature of ash offsets acidic nature of the sites, facilitating vegetation and life
- Ash used to fill in the sites and is subsequently covered with soil and seeded until fully reclaimed

Calcium content of ash also facilitates absorption of CO<sub>2</sub>, which is the focus of our carbon capture efforts

# Carbon Capture Key Assumptions

<p><b>Tons of CO<sub>2</sub> Captured</b></p>	<ul style="list-style-type: none"> <li>• Total ash production of 800-900k metric tons at baseload capacity utilization</li> <li>• 8-12% CO<sub>2</sub> capture by weight of ash</li> <li>• <b>Implies ~60-100k tons of CO<sub>2</sub> captured</b></li> </ul>
<p><b>Multiple Income Streams</b></p>	<ul style="list-style-type: none"> <li>• Private Market: \$120-200/ton, beginning 2024, reaching capacity in 2025</li> <li>• IRS 45Q: up to \$180/ton, earliest qualification would be 2025 but 2026 is more likely</li> </ul>
<p><b>Operating Expenses</b></p>	<ul style="list-style-type: none"> <li>• 10% of carbon credit gross proceeds and 5% of 45Q tax credit proceeds paid out in the form of fees and royalties</li> <li>• Annual fixed opex of \$1.5mm (includes personnel and equipment leasing)</li> <li>• Variable opex of \$30 per ton of CO<sub>2</sub> captured</li> <li>• No incremental G&amp;A</li> </ul>
<p><b>Capital Expenditures</b></p>	<ul style="list-style-type: none"> <li>• 100-150 <u>Karboliths™</u> @ \$40-60k per <u>Karbolith™</u> for equipment</li> <li>• \$1-2mm for labor/construction</li> </ul>





**Q3 2023**

# Q3 2023 Results



## Results

Bitcoins Mined	<b>620</b>
Total Revenue (mm)	<b>\$17.7</b>
Net Loss (mm)	<b>(\$22.3)</b>
Adjusted EBITDA (mm) *	<b>(\$2.4)</b>

\* Presentation includes non-GAAP financial measures; Adjusted EBITDA references related to third quarter 2023 throughout the presentation should be considered in connection with the Reconciliation of non-GAAP on page 28



# Appendix

Other Information

# Reconciliation of Non-GAAP Items

Reconciliation of Adjusted EBITDA (mm)	Q3 2023
<b>Net income (loss)</b>	<b>(\$22.3)</b>
Interest expense	2.4
Depreciation and amortization	9.7
Impairments on equipment deposits	5.4
Impairments on digital currencies	0.4
Stock-based compensation	0.8
Change in fair value of warrant liabilities	0.2
Realized gain on sale of digital currencies	(0.1)
Non-recurring expenses	1.2
<b>Adjusted EBITDA (Non-GAAP)</b>	<b>(\$2.4)</b>

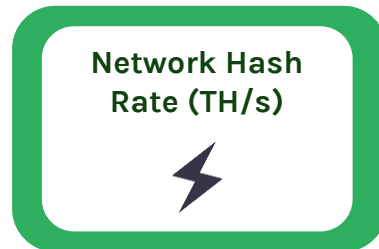
Note: Items that round to \$0.0 million have been left off as the calculation remains unchanged as presented

# Hash Price Calculation

The metric that drives BTC mining revenue, reflecting both BTC price and network hash rate



*Divided by:*



Bitcoin Network Hash Price (\$/TH/s per Day)



Note: Hash price per daily Bitcoin price and network hash rate calculated from difficulty

Note: Bitcoin mining revenue is based on a hash price on \$ per terahash per second (“TH/s”) per day. Hash price represents global Bitcoin mining revenue per TH/s of network hash rate, incorporates both Bitcoin price and network hash rate and it is calculated as follows: [Bitcoin price] x [number of Bitcoins mined per day (~900)] x [1 + transaction fee %] ÷ [network hash rate (TH/s)]

1. Current block subsidies are 6.25 BTC



# Investor Contact

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Pictured: Actual Reclaimed Mining Waste Site



STRONGHOLD