

Is landfill gas an economically & environmentally attractive solution?



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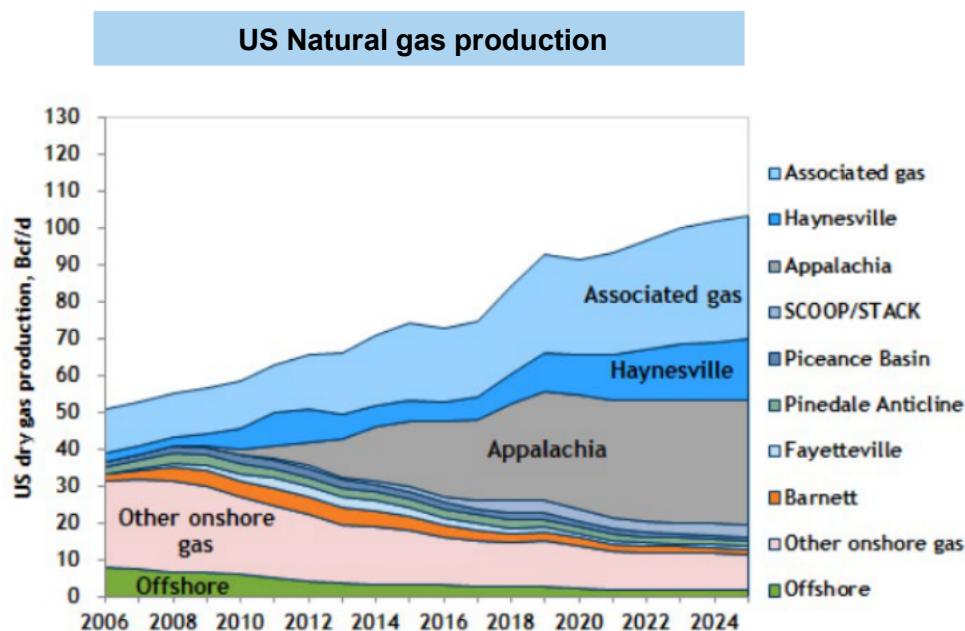
PM Summary

- **Announced RNG targets point to demand absorbing the industry capacity ramp.** The biggest investor question is whether the market will absorb a doubling in landfill gas supply on the 100+ projects that have emerged over the past year. We point out that the state of California and National Grid utility alone have committed to buying 100 mn MMBtu by 2030, compared to projected pipeline supply of 75 mn MMBtu. Landfill gas accounts for just 0.2% of US gas supply, making a doubling of the market - while impactful for the Environmental Services sector - not meaningful for overall supply-demand.
- **We estimate landfill gas creates \$11 in value per MMBtu via carbon reduction.** Landfill gas total costs are ~\$5 per MMBtu higher than conventional gas, but the value of carbon reduction is \$11. And unlike other green fuels, there is no food for fuel trade-off with RNG.
- **We see meaningful contribution to earnings power from landfill gas that is not currently modeled into consensus.** Over 5-8 years, we think announced landfill gas projects can add up to 21% to FCF for the industry. We estimate near-term upside is led by WM (2-4% EBITDA tailwind in 2023).

We reiterate our Buy ratings on RSG (on CL), WM, WCN, and GFL as we see (i) accelerating pricing and unit profitability – the primary driver of multiples, (ii) high visibility on double digit growth in 2023, and (iii) value-enhancing capital deployment opportunities in Landfill Gas and Recycling not currently modeled into consensus forecasts.

Announced RNG targets point to demand absorbing the industry capacity ramp

- We are tracking >100 landfill gas projects that we expect to add ~75 mn MMBtu of annual production through 2030 essentially doubling the size of the RNG market today of 74 mn MMBtu (205 MMcf/day).
- To put the RNG production ramp in context, the current RNG market makes up just 0.2% of the ~35 bn MMBtu natural gas market with the industry ramp up bringing RNG to ~0.4% of the natural gas market.
- California and the National Grid utility alone have outlined targets to use 100 mn MMBtu of gas by 2030 (274 MMcf/day) - effectively enough to absorb announced supply additions to date.
- Beyond external demand sources, the Environmental Services industry also has significant runway to power its own truck fleet with RNG. For example, GFL has a goal of converting 50% to 70% of its fleet to compressed natural gas from 15% today.

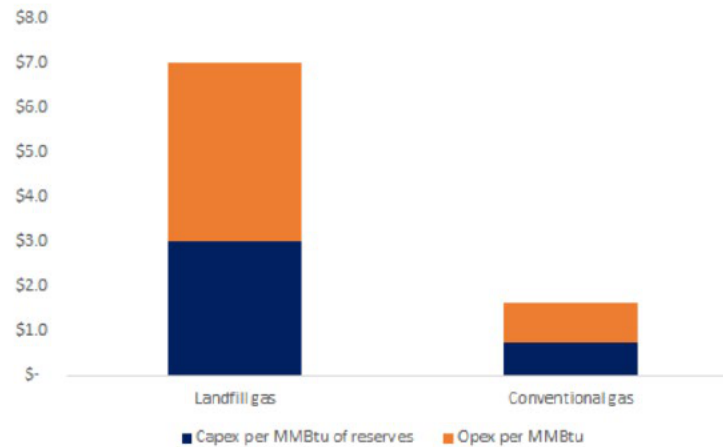


Source: Goldman Sachs Global Investment Research, Company data, EPA, EIA, IHS, Arkansas Oil & Gas Commission, PA DEP, Ohio DNR, LA DNR

We estimate landfill gas creates \$11 in value per MMBtu via carbon reduction

- Landfill gas buyers in the \$20's per MMBtu are paying a ~\$15 per MMBtu premium over conventional gas. However, we estimate they are getting a \$30-\$35 carbon benefit when they are buying landfill gas from facilities that had not previously captured gas. For facilities where gas is already being flared, the carbon reduction benefit based on the parameters outlined above is \$1.20.

Landfill gas unit economics compared to conventional gas



Assuming a \$75 per ton value for carbon yields a carbon benefit of \$30 per MMBtu for fugitive gas

$$\begin{array}{l}
 \text{Rio Tinto's carbon price assessment} \\
 \$75 \text{ per ton}
 \end{array}
 \times
 \begin{array}{l}
 \text{Carbon coefficient of pipeline natural gas burned} \\
 0.016 \text{ tons per MMBtu}
 \end{array}
 \times
 \begin{array}{l}
 \text{Increased intensity of direct methane emissions rather than burning} \\
 25x
 \end{array}
 =
 \begin{array}{l}
 \text{Carbon benefit per MMBtu for fugitive gas} \\
 \$30
 \end{array}$$

Assuming a \$75 per ton value for carbon yields a carbon benefit of \$1.20 per MMBtu for flared gas

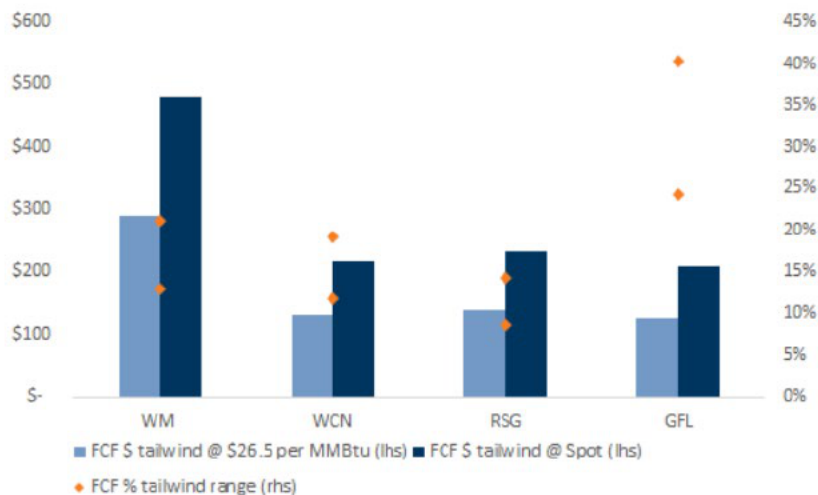
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Source: Goldman Sachs Global Investment Research, Company data, EPA,

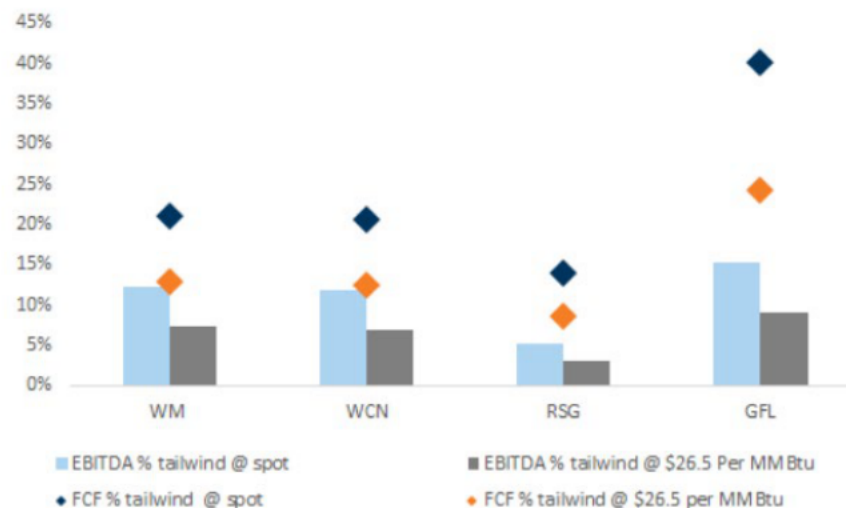
We see meaningful contribution to earnings power from landfill gas

- We estimate that GFL can add an incremental C\$160-C\$270 mn (24%-40%) to FCF by 2028, a 9-15% tailwind to unit profitability.
- We estimate that WM can add an incremental \$290-\$480 mn (13-21%) to FCF by 2026, a 7%-12% tailwind to unit profitability.
- We estimate that WCN can add an incremental \$140-\$235 mn (13-21%) to FCF by 2030, a 7%-12% tailwind to unit profitability.
- We estimate that RSG can add an incremental \$140-\$225 mn (9-14%) to FCF by 2028, 3%-5% tailwind to unit profitability.

Potential incremental FCF tailwind by company, based on announced project pipelines



The landfill gas tailwind to FCF is significantly greater than EBITDA

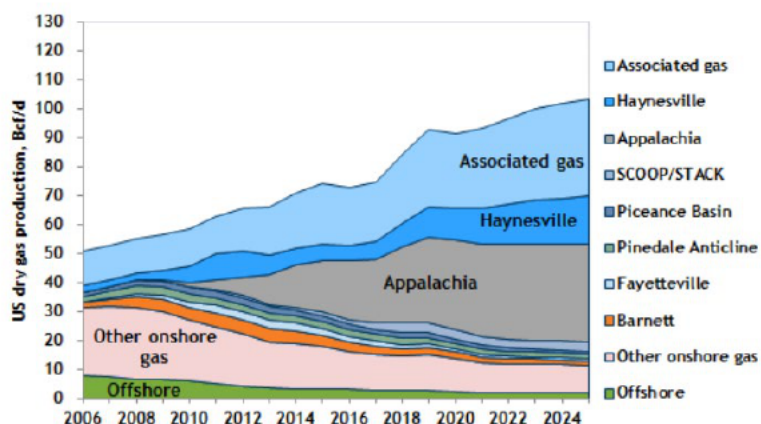


Can the US gas market absorb the RNG capacity ramp?

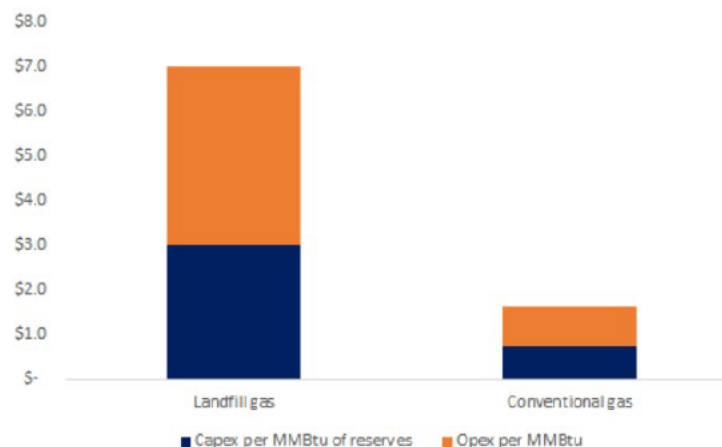
Can the US gas market absorb the RNG capacity ramp?

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The current RNG market makes up just 0.2% of the ~35 bn MMBtu natural gas market



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Source: Goldman Sachs Global Investment Research, Company data, EPA, EIA, IHS, Arkansas Oil & Gas Commission, PA DEP, Ohio DNR, LA DNR

Can the US gas market absorb the RNG capacity ramp?

2020 Scope 1 GHG emission intensity, 2024E EBITDA per Mcfe (assumes \$90/bbl Brent and \$3.45/MMBtu Henry Hub gas price) and EBITDA impact from carbon pricing

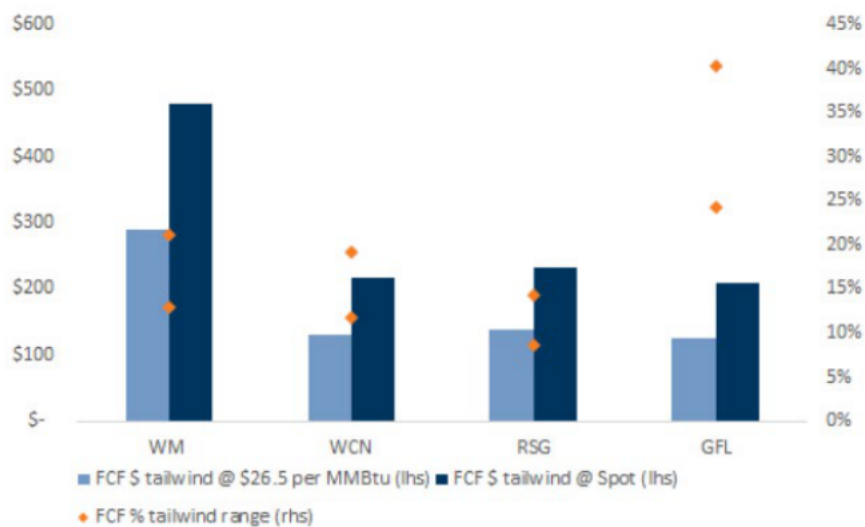
| | 2020 emissions intensity (tCO2e per mn Mcfe) | 2024E EBITDA per Mcfe | EBITDA sensitivity from carbon price (\$/ton) | | |
|--------|--|-----------------------|---|------|-------|
| | | | \$25 | \$75 | \$125 |
| AR | 328 | 2.22 | 0% | 1% | 2% |
| EQT | 418 | 2.06 | 1% | 2% | 3% |
| SWN | 835 | 1.96 | 1% | 3% | 5% |
| RRC | 230 | 2.21 | 0% | 1% | 1% |
| NFG | 783 | 2.23 | 1% | 3% | 4% |
| CRK | 520 | 2.60 | 1% | 2% | 3% |
| Median | 469 | 2.22 | 1% | 2% | 3% |

Source: Company data, Goldman Sachs Global Investment Research

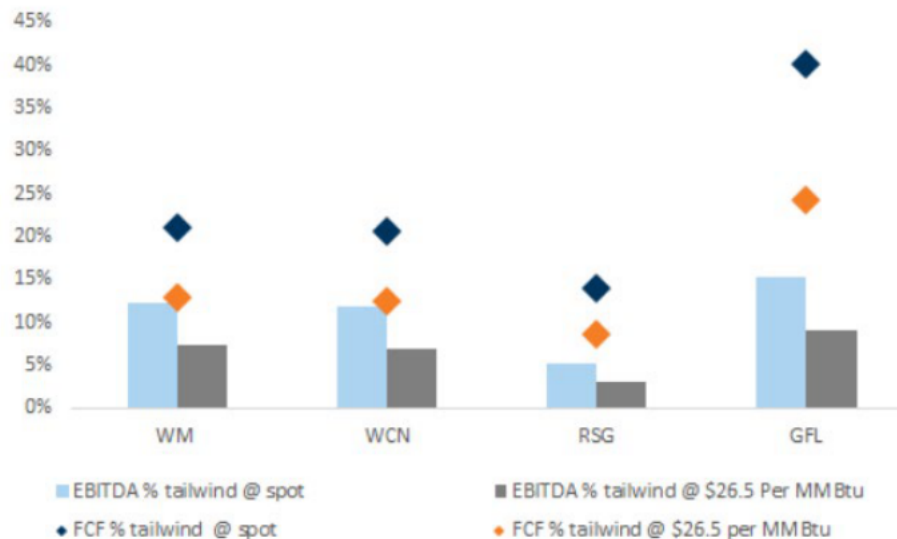
Landfill gas model summary

Goldman Sachs Landfill gas model summary

Potential incremental FCF tailwind by company, based on announced project pipelines



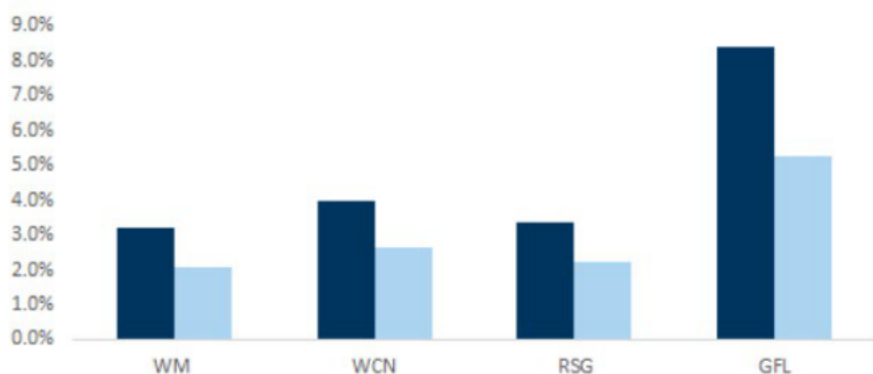
The landfill gas tailwind to FCF is significantly greater than EBITDA



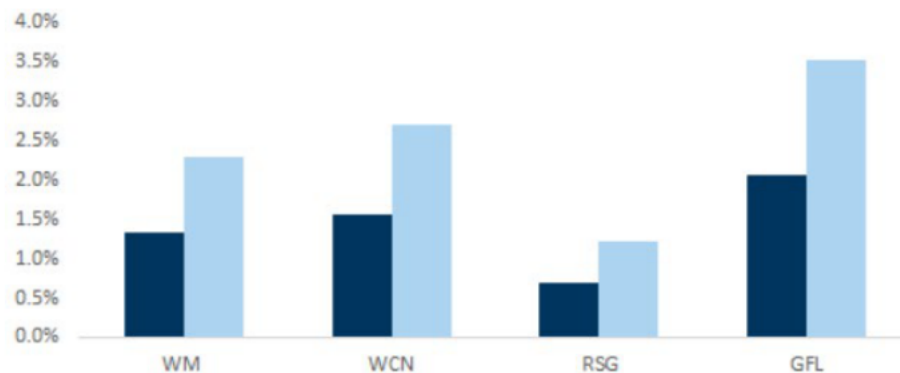
Goldman Sachs Landfill gas model summary

Landfill gas has potential to drive a 250-400 bps improvement in FCF conversion for the industry

Landfill gas has potential to drive a 130-220 bps improvement in EBITDA margin for the industry



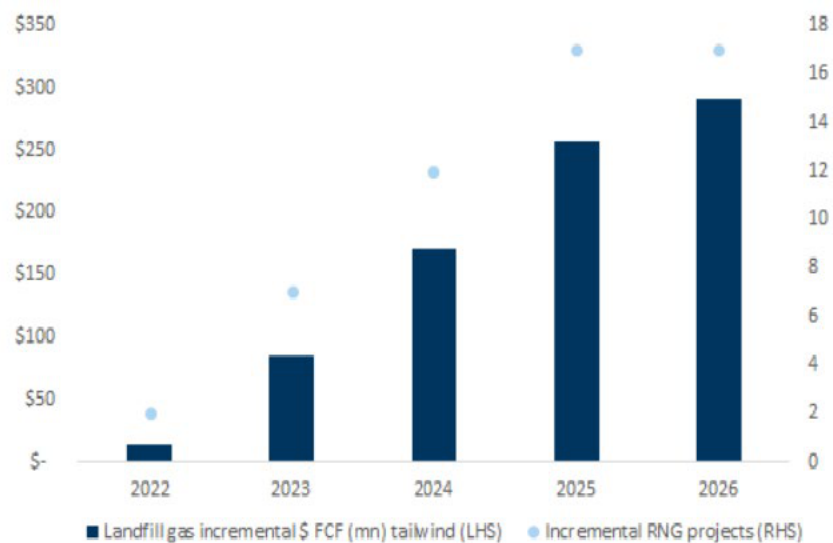
■ % FCF conversion tailwind from landfill gas @ spot
 ■ % FCF conversion tailwind from landfill gas @ \$26.50 per MMBtu



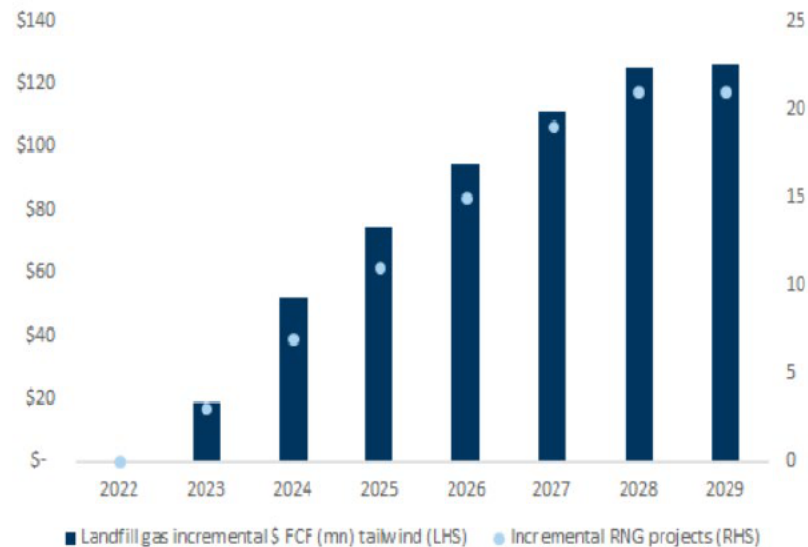
■ % Margin tailwind from landfill gas @ \$26.50 per MMBtu
 ■ % Margin tailwind from landfill gas @ spot

Goldman Sachs Landfill gas model summary

WM: Landfill gas can add an incremental \$290-\$480 mn (13-21%) to FCF by 2026



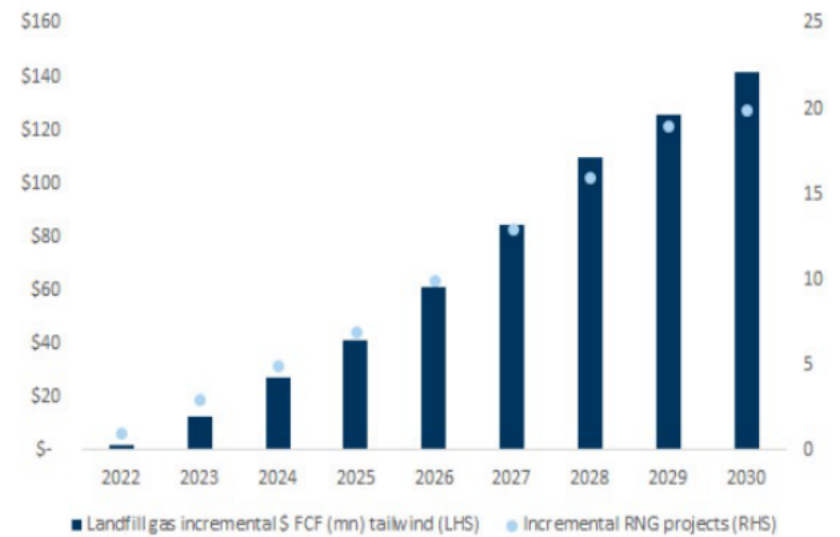
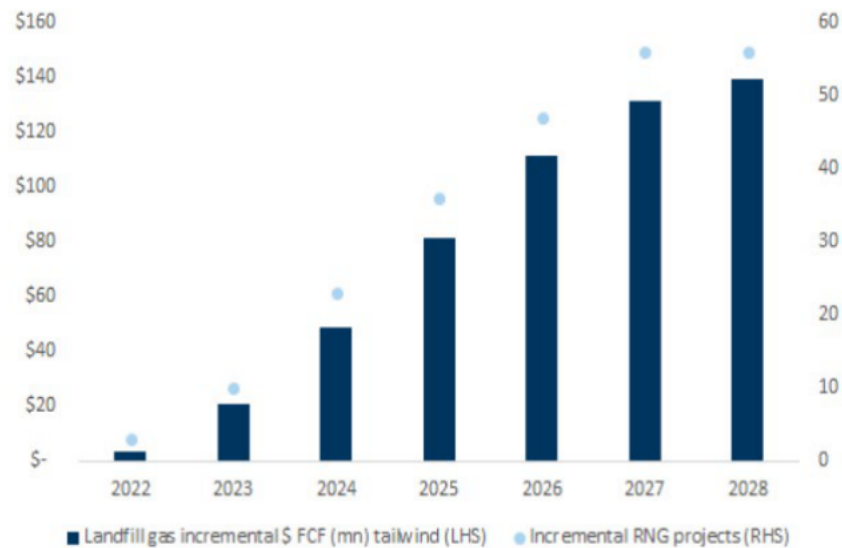
GFL: Landfill gas can add an incremental \$125-\$210 mn (24%-40%) to FCF by 2028



Goldman Sachs Landfill gas model summary

RSG: Landfill gas can add an incremental \$140-\$225 mn (9-14%) to FCF by 2028

WCN: Landfill gas can add an incremental \$140-\$235 mn (13-21%) to FCF by 2028



Goldman Sachs Landfill gas model summary

Landfill Gas IRR at \$26.50 per MMBtu

Project Level

| | |
|----------|------|
| IRR | 32% |
| NPV @10% | \$43 |
| R | 10% |

Landfill gas owner IRR

| | |
|----------|------|
| IRR | 41% |
| NPV @10% | \$30 |
| R | 10% |

| Year | 0 | 1 | 2 | 3 | 4 | 5 | 25 | 26 | 27 | 28 | 29 | 30 |
|--|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Capex (\$ mn) | \$ (23) | | | | | | | | | | | |
| Revenue (\$ mn) | \$ 13 | \$ 13 | \$ 13 | \$ 13 | \$ 13 | \$ 13 | \$ 13 | \$ 13 | \$ 13 | \$ 13 | \$ 13 | \$ 13 |
| Revenue per MMBtu | \$26.5 | \$26.5 | \$26.5 | \$26.5 | \$26.5 | \$26.5 | \$26.5 | \$26.5 | \$26.5 | \$26.5 | \$26.5 | \$26.5 |
| Production (mn MMBtu) | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Gas price | \$3 | \$3 | \$3 | \$3 | \$3 | \$3 | \$3 | \$3 | \$3 | \$3 | \$3 | \$3 |
| RIN3 price | \$2.0 | \$2.0 | \$2.0 | \$2.0 | \$2.0 | \$2.0 | \$2.0 | \$2.0 | \$2.0 | \$2.0 | \$2.0 | \$2.0 |
| RIN3 per MMBtu | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Opex (\$ mn) | \$ (2) | \$ (2) | \$ (2) | \$ (2) | \$ (2) | \$ (2) | \$ (2) | \$ (2) | \$ (2) | \$ (2) | \$ (2) | \$ (2) |
| Project EBITDA & investment (\$ mn) | \$ (23) | \$ 11 | \$ 11 | \$ 11 | \$ 11 | \$ 11 | \$ 11 | \$ 11 | \$ 11 | \$ 11 | \$ 11 | \$ 11 |
| <i>Environmental Services share of EBITDA</i> | \$ (12) | \$ 6 | \$ 6 | \$ 6 | \$ 6 | \$ 6 | \$ 6 | \$ 6 | \$ 6 | \$ 6 | \$ 6 | \$ 6 |
| Assumed maintenance capex (\$ mn) | \$ (0) | \$ (0) | \$ (0) | \$ (0) | \$ (0) | \$ (0) | \$ (0) | \$ (0) | \$ (0) | \$ (0) | \$ (0) | \$ (0) |
| Assumed tax expense (\$ mn) | \$ (3) | \$ (3) | \$ (3) | \$ (3) | \$ (3) | \$ (3) | \$ (3) | \$ (3) | \$ (3) | \$ (3) | \$ (3) | \$ (3) |
| Project FCF (\$ mn) | \$ (23) | \$ 8 | \$ 8 | \$ 8 | \$ 8 | \$ 8 | \$ 8 | \$ 8 | \$ 8 | \$ 8 | \$ 8 | \$ 8 |
| <i>Environmental Services share of FCF</i> | \$ (12) | \$ 5 | \$ 5 | \$ 5 | \$ 5 | \$ 5 | \$ 5 | \$ 5 | \$ 5 | \$ 5 | \$ 5 | \$ 5 |

Project details

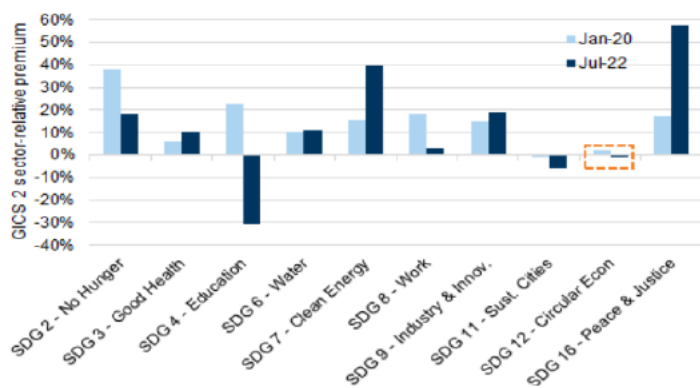
| | |
|---------------------|--------|
| Capacity (mn MMBtu) | 0.5 |
| Total Capex (\$ mn) | \$ 23 |
| Price per MMBtu | \$26.5 |
| Opex per MMBtu | \$4.50 |
| Capex per MMBtu | \$ 47 |
| Royalty rate | 15% |
| Equity split | 50% |

An ESG perspective: Opportunity for further tailwinds from resilient ESG asset flows

An ESG perspective: Opportunity for further tailwinds from resilient ESG asset flows

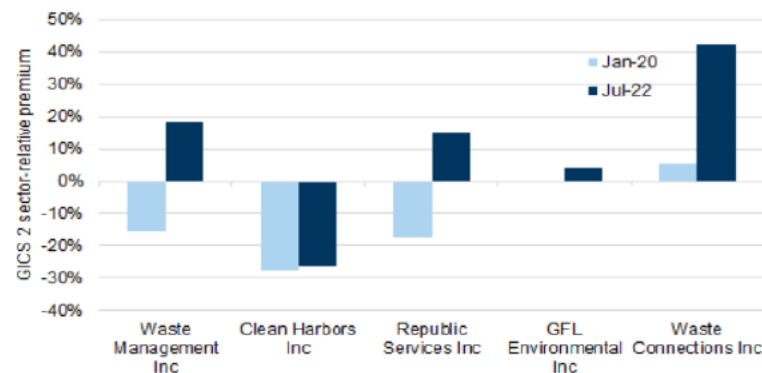
Recycling, waste management & environmental remediation appear underappreciated relative to other key sustainable thematic categories

12m fwd EV/EBITDA premiums vs. GICS-2 ACWI peers (trimmed mean, capped at 100x) for SDG-aligned cohorts (January 2020 vs. Current premiums)



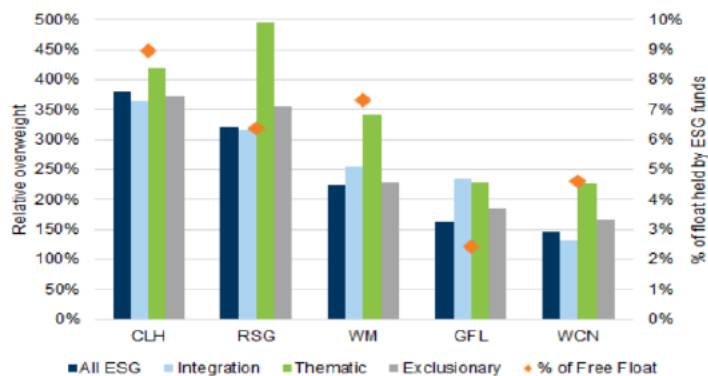
In GS Environmental Services coverage, CLH appears most underappreciated relative to peers

12m fwd EV/EBITDA premiums vs. GICS-2 ACWI peers



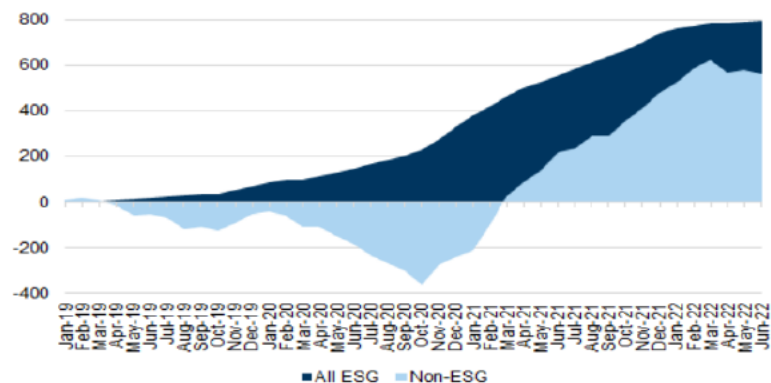
GFL could further grow its ESG ownership, relative to peers

ESG ownership relative to benchmark weight (MSCI ACWI) by ESG strategy (LHS); % of float owned by ESG funds (RHS)



Flows to ESG funds have outpaced non-ESG on a cumulative basis since 2019

Cumulative monthly global equity fund flows (\$bn)

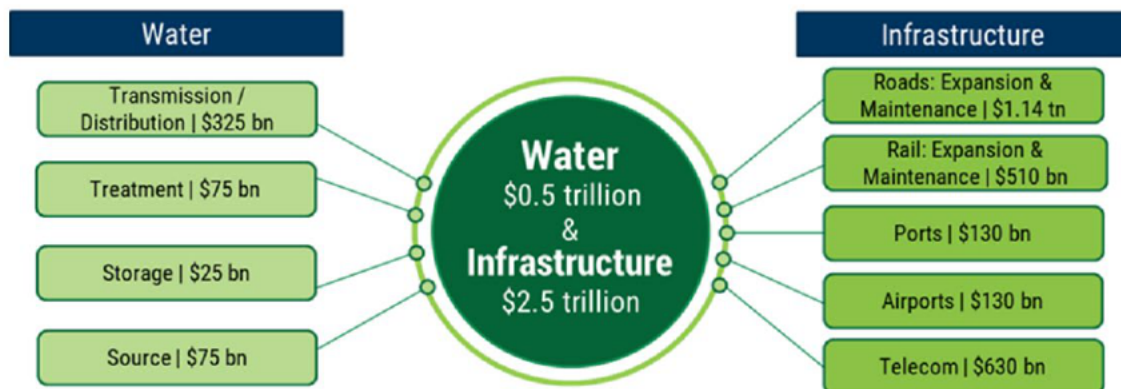
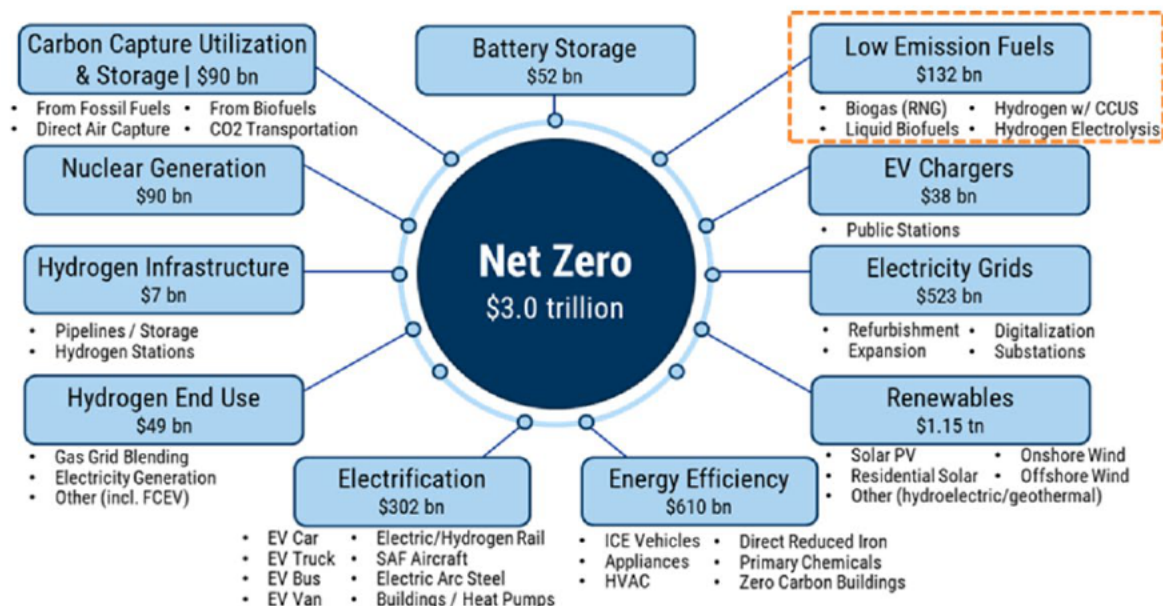


Source: Morningstar, Goldman Sachs Global Investment Research, Refinitiv Eikon

GS SUSTAIN: A Green Capex perspective on Renewable Natural Gas

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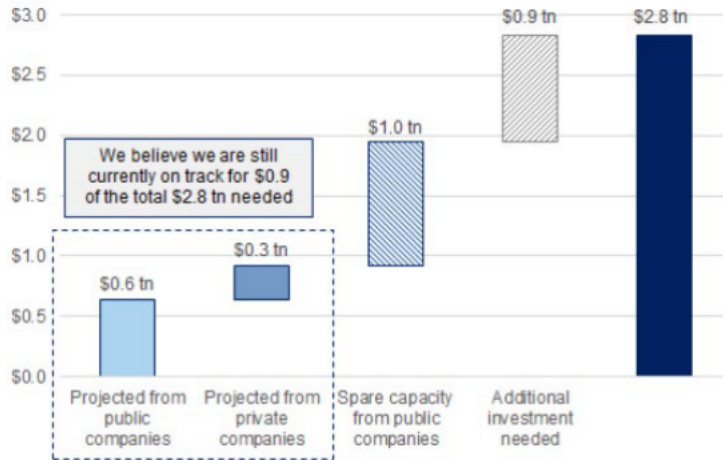
Critical technologies/focus areas and annual investment in the 2020s to achieve Net Zero, Infrastructure and Clean Water needs



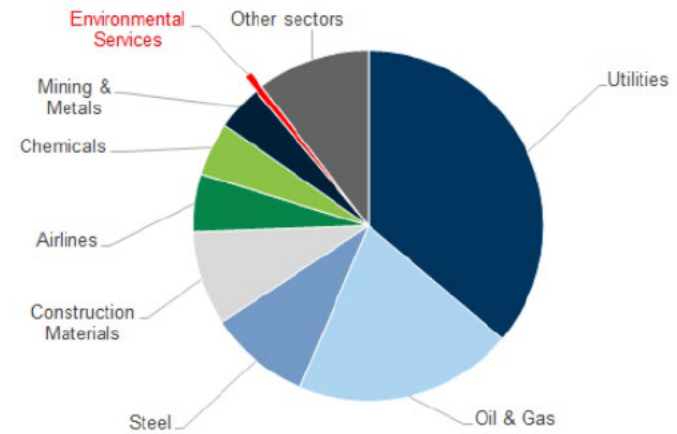
Source: IEA, McKinsey, OECD, Company data, Goldman Sachs Global Investment Research

GS SUSTAIN: A Green Capex perspective on Renewable Natural Gas

Incremental annual investment needed this decade to meet Net Zero, infrastructure and clean water goals



Sector breakdown of global Scope 1 emissions from corporates in our GS SUSTAIN coverage



Source: Company data, Thomson Reuters, Bloomberg, Goldman Sachs Global Investment Research, EDGAR, IEA, OECD, McKinsey & Company, FactSet, Preqin,

Disclosure Appendix

September 7, 2022

Reg AC

We, Jerry Revich, CFA, Adam Bubes, CFA, Brian Singer, CFA, Neil Mehta, Umang Choudhary, Derek R. Bingham, Enrico Chinello, Ph.D., Michael Hao Wu, CFA, Jatin Khanna, Clay Williams, CFA, Brendan Corbett, Varsha Venugopal and Jacob Clohisy, hereby certify that all of the views expressed in this report accurately reflect our personal views about the subject company or companies and its or their securities. We also certify that no part of our compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

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|--------|---------------------|------|------|----------------------------------|------|------|
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Price target and rating history chart(s)

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