

## Origin Materials

# Asset-light strategies reduce risk but present value drops; Reiterate Neutral

Reiterate Rating: NEUTRAL | PO: 0.60 USD | Price: 0.52 USD

## Partnering is the low-risk path for the CMF technology

We continue to see significant long-term potential for Origin's CMF technology to produce myriad advantaged and sustainable products such as bio-based PET packaging, biodegradable PEF packaging, higher performing furan-based surfactants, and HTC-derived carbon black. To accelerate the path to commercial production and reduce risks, we concur with ORGN's asset-light partnering/licensing approach. The company's \$10bn in capacity reservations clearly reflects customer demand, but the [funding needs for a wholly-owned production facility are too significant](#). The licensing approach also offers advance payments and annual licensing fees. However, there is no certainty about these partnerships, and these challenges are broadly consistent among the new entrants in sustainable plastic, driving down valuations (see below).

## New PET caps/closure business to provide cash flow

Origin has developed a novel approach to producing mono-material caps and closures for PET containers and bottles, which had not previously been achievable, resulting in more challenging recycling efforts. As a low-capital investment with near-term cash generation, Origin intends to invest in packaging equipment to produce plastic caps either from virgin or recycled PET, and eventually from biobased PET using Origin's CMF process. The company expects to have its first line operational within 12 months, and additional lines in the future. Given the competitive dynamics among packaging companies and execution risks, we would view a technology licensing approach as less risky, but according to management their selected strategy should allow them to command premium pricing and generate strong returns on their investment.

## Valuations underwhelming for sustainable plastic entrants

Investor interest in new entrant companies with sustainable plastic technologies has been declining over the last couple years due, in our view, to increased capital costs and the modest pace of adoption by the legacy polymer and packaging companies. Among the 20+ startups with sustainable plastic technology that we follow, 7 are publicly traded, and the share prices are all meaningfully down over the last 2 years (see Exh 1). Re: ORGN, we have made several changes to our model (see next page) yet still see negative operating cash flow until 2027. We are also raising our WACC to 15% from 12.5% on increased risks given the lack of any licensing deals so far, resulting in a reduced DCF-derived PO of \$0.60 from \$2 previously. Reiterate Neutral.

Estimates (Dec) (US\$)	2022A	2023A	2024E	2025E	2026E
EPS	0.55	0.17	(0.38)	(0.31)	(0.26)
GAAP EPS	0.57	0.17	(0.39)	(0.34)	(0.29)
EPS Change (YoY)	111.5%	-69.1%	NM	18.4%	16.1%
Consensus EPS (Bloomberg)			(0.51)	(0.19)	(0.11)
DPS	0	0	0	0	0
Valuation (Dec)					
P/E	0.9x	2.9x	NM	NM	NM
Free Cash Flow Yield*	-152.4%	-225.6%	-85.5%	-92.9%	-107.6%

\* For full definitions of *IQmethod*<sup>SM</sup> measures, see page 5.

18 March 2024

### Equity

#### Key Changes

(US\$)	Previous	Current
Price Obj.	2.00	0.60
2024E Rev (m)	87.9	31.6
2025E Rev (m)	104.0	63.7
2026E Rev (m)	106.3	82.3
2024E EPS	-0.47	-0.38
2025E EPS	-0.48	-0.31
2026E EPS	-0.60	-0.26

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### Stock Data

Price	0.52 USD
Price Objective	0.60 USD
Date Established	18-Mar-2024
Investment Opinion	C-2-9
52-Week Range	0.48 USD - 5.04 USD
Mrkt Val (mn) / Shares Out (mn)	76 USD / 145.9
Free Float	76.3%
Average Daily Value (mn)	0.99 USD
BofA Ticker / Exchange	ORGN / NAS
Bloomberg / Reuters	ORGN US / ORGN.OQ
ROE (2024E)	-13.8%
Net Dbt to Eqty (Dec-2023A)	-37.5%

See page 2 for Acronyms

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**Refer to important disclosures on page 6 to 8. Analyst Certification on page 4. Price Objective Basis/Risk on page 4.**

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Timestamp: 18 March 2024 06:00AM EDT

# iQprofile<sup>SM</sup> Origin Materials

## iQmethod<sup>SM</sup> – Bus Performance\*

(US\$ Millions)	2022A	2023A	2024E	2025E	2026E
Return on Capital Employed	-5.5%	-9.5%	-12.3%	-11.6%	-9.2%
Return on Equity	23.0%	6.0%	-13.8%	-13.1%	-11.9%
Operating Margin	NA	-190.5%	-186.2%	-79.0%	-55.3%
Free Cash Flow	(110)	(163)	(62)	(67)	(78)

## iQmethod<sup>SM</sup> – Quality of Earnings\*

(US\$ Millions)	2022A	2023A	2024E	2025E	2026E
Cash Realization Ratio	-0.3x	-2.5x	NM	NM	NM
Asset Replacement Ratio	117.7x	30.4x	2.3x	3.0x	4.8x
Tax Rate	NM	NM	5.0%	5.0%	5.0%
Net Debt-to-Equity Ratio	-85.8%	-37.5%	-25.8%	-14.0%	3.7%
Interest Cover	NA	NA	NA	NA	NA

## Income Statement Data (Dec)

(US\$ Millions)	2022A	2023A	2024E	2025E	2026E
Sales	0	29	32	64	82
% Change	NA	NA	9.9%	101.4%	29.2%
Gross Profit	0	5	0	4	10
% Change	NA	NA	NM	NM	125.5%
EBITDA	(31)	(42)	(39)	(31)	(25)
% Change	-55.1%	-35.0%	6.1%	22.4%	16.5%
Net Interest & Other Income	118	78	1	0	2
<b>Net Income (Adjusted)</b>	<b>78</b>	<b>24</b>	<b>(55)</b>	<b>(48)</b>	<b>(41)</b>
<b>% Change</b>	<b>183.0%</b>	<b>-69.6%</b>	<b>NM</b>	<b>13.5%</b>	<b>13.5%</b>

## Free Cash Flow Data (Dec)

(US\$ Millions)	2022A	2023A	2024E	2025E	2026E
Net Income from Cont Operations (GAAP)	79	24	(55)	(48)	(41)
Depreciation & Amortization	1	3	12	12	13
Change in Working Capital	(6)	(30)	1	(2)	4
Deferred Taxation Charge	NA	NA	NA	NA	NA
Other Adjustments, Net	(100)	(57)	8	8	8
Capital Expenditure	(84)	(102)	(28)	(38)	(60)
<b>Free Cash Flow</b>	<b>-110</b>	<b>-163</b>	<b>-62</b>	<b>-67</b>	<b>-78</b>
<b>% Change</b>	<b>-220.0%</b>	<b>-48.1%</b>	<b>62.1%</b>	<b>-8.6%</b>	<b>-15.8%</b>
Share / Issue Repurchase	0	0	0	0	0
Cost of Dividends Paid	0	0	0	0	0
Change in Debt	0	0	0	0	100

## Balance Sheet Data (Dec)

(US\$ Millions)	2022A	2023A	2024E	2025E	2026E
Cash & Equivalents	323	158	97	50	87
Trade Receivables	NA	NA	NA	NA	NA
Other Current Assets	8	29	28	32	34
Property, Plant & Equipment	154	243	258	284	336
Other Non-Current Assets	8	32	32	32	32
<b>Total Assets</b>	<b>494</b>	<b>462</b>	<b>414</b>	<b>397</b>	<b>489</b>
Short-Term Debt	0	0	0	0	0
Other Current Liabilities	20	13	13	16	22
Long-Term Debt	0	0	0	0	100
Other Non-Current Liabilities	97	26	26	26	26
<b>Total Liabilities</b>	<b>117</b>	<b>39</b>	<b>40</b>	<b>43</b>	<b>148</b>
<b>Total Equity</b>	<b>377</b>	<b>423</b>	<b>375</b>	<b>355</b>	<b>341</b>
<b>Total Equity &amp; Liabilities</b>	<b>494</b>	<b>462</b>	<b>414</b>	<b>397</b>	<b>489</b>

\* For full definitions of iQmethod<sup>SM</sup> measures, see page 5.

## Company Sector

Chemicals-Major

## Company Description

ORGN is a novel materials company developing cellulose-based solutions for the plastics industry. Its CMF and HTC products can be used to produce PET, para-xylene, and carbon black and activated carbon substitutes. The company expects to generate meaningful revenue starting in 2023 from its Origin 1 plant and substantial revenue and earnings from its Origin 2+ plants.

## Investment Rationale

While we remain positive on the end market demand for ORGN's bio-based products and its technology, the sharp rise in capex needs and reduction in expected earnings contribution for Origin 2 leads to a significant impairment to our net present value. It also raises significant doubts regarding the company's ability to raise the required financing in a non-dilutive manner. As such we are Neutral on the stock.

## Stock Data

Average Daily Volume 1,887,707

## Quarterly Earnings Estimates

	2023	2024
Q1	0.07A	-0.10E
Q2	-0.05A	-0.10E
Q3	0.22A	-0.09E
Q4	-0.07A	-0.10E

## Acronyms

CMF – Chloromethyl furfural

HTC – Hydrothermal carbon

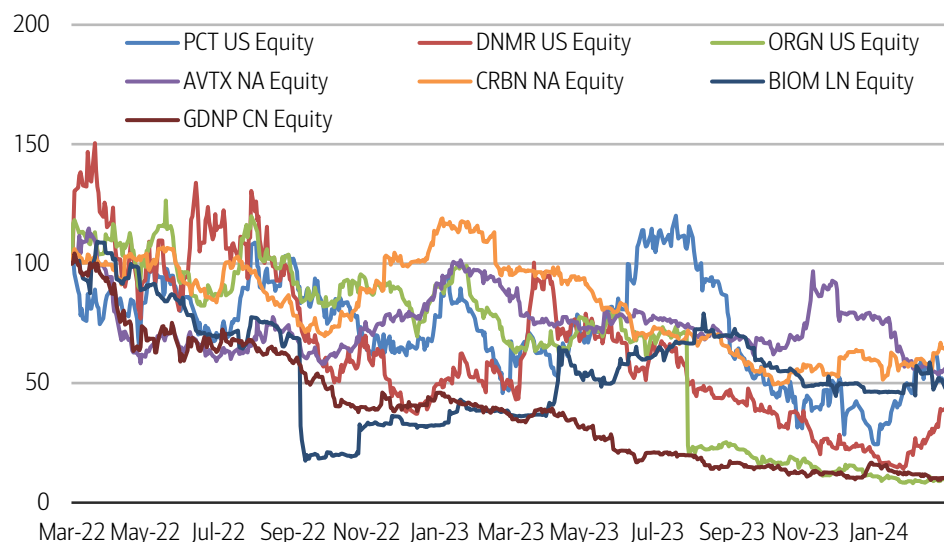
PV – Present Value

PET – Polyethylene terephthalate

PEF – Polyethylene furanoate

### Exhibit 1: Sustainable Plastic Entrants' Share Price Over Last Two Years (Indexed to 100)

Share prices for all of the names are down meaningfully over the last two years



Source: Bloomberg, BofA Global Research

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## Key changes to our model

Below we summarize the key changes to our model:

- We have added a packaging revenue/profit stream, starting with one packaging line in 2025 and moving towards five lines over the next decade. Our estimates are for each line to add \$5mn in gross profit, which would be a substantial return on investment given the ~\$5mn cost per line.
- We have significantly lowered our assumed operating rates for Origin 1 to align with ORNG's low revenue guidance for 2024, and slightly improved the unit economics as the company prioritizes higher-profit products.
- We are unsure if Origin 2 in its latest iteration (with regard to capex/EBITDA) will ever materialize, but still include it in our model. However, we have pushed back the start-up to 2029 (from 2027) for phase 1 and 2031 (from 2029) for phase 2 given that ORGN strives to reduce its cash burn.
- We no longer assume ORGN builds another wholly-owned plant and have removed Origin 3 from our model. Previously we had a 2032 start-up.
- We continue to assume three licensing opportunities with petrochemical companies for the production of bio-based paraxylene. While the economics of such deals are highly uncertain, we assume net licensing income of \$11mn per year from each plant. We expect said plants to commence operations (and thus payments to ORGN) in 2027-29.



## Price objective basis & risk

### Origin Materials (ORGN)

Our \$0.60 PO for ORGN is based on a discounted cash flow analysis out to 2032, chosen due to the timeline of its projects. We chose a WACC of 15% which also incorporates the risks of securing project financing. We also chose a 3% terminal value, as we expect fewer company-owned plants.

Upside risks to our PO could come from lower-than-expected capex needs, higher EBITDA generation, signing of licensing agreements, and progress in non-dilutive project financing.

Downside risk to our PO could come from additional earnings margin pressure, further cost increases for Origin 2 and other growth projects, lower-than-expected demand for ORGN's novel projects, and dilutive financing.

## Analyst Certification

I, Steve Byrne, CFA, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

### US - Chemicals Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
<b>BUY</b>				
	Air Products	APD	APD US	Steve Byrne, CFA
	Axalta Coating Systems	AXTA	AXTA US	Steve Byrne, CFA
	Bunge Limited	BG	BG US	Salvator Tiano, CFA
	CF Industries	CF	CF US	Steve Byrne, CFA
	Dow Inc	DOW	DOW US	Steve Byrne, CFA
	Eastman Chemical Co	EMN	EMN US	Salvator Tiano, CFA
	Element Solutions Inc.	ESI	ESI US	Steve Byrne, CFA
	Green Plains	GPPE	GPPE US	Salvator Tiano, CFA
	Huntsman Corp	HUN	HUN US	Salvator Tiano, CFA
	Linde	LIN	LIN US	Steve Byrne, CFA
	Linde	LINGY	LIN GY	Steve Byrne, CFA
	Nutrien	NTR	NTR US	Steve Byrne, CFA
	Olin Corp	OLN	OLN US	Steve Byrne, CFA
	PPG Industries Inc.	PPG	PPG US	Steve Byrne, CFA
	Sigma Lithium	SGML	SGML US	Steve Byrne, CFA
	The Mosaic Company	MOS	MOS US	Steve Byrne, CFA
<b>NEUTRAL</b>				
	Archer-Daniels-Midland Company	ADM	ADM US	Salvator Tiano, CFA
	Corteva	CTVA	CTVA US	Steve Byrne, CFA
	Ecolab Inc	ECL	ECL US	Steve Byrne, CFA
	International Flavors & Fragrances	IFF	IFF US	Salvator Tiano, CFA
	LyondellBasell Industries	LYB	LYB US	Steve Byrne, CFA
	Origin Materials	ORGN	ORGN US	Steve Byrne, CFA
<b>UNDERPERFORM</b>				
	Celanese Corporation	CE	CE US	Salvator Tiano, CFA
	DuPont	DD	DD US	Steve Byrne, CFA
	FMC Corporation	FMC	FMC US	Steve Byrne, CFA
	RPM International Inc	RPM	RPM US	Steve Byrne, CFA
	Sherwin-Williams Company	SHW	SHW US	Steve Byrne, CFA
	Westlake Chemical Partners, LP	WLKP	WLKP US	Steve Byrne, CFA

## US - Chemicals Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
	Westlake Corp	WLK	WLK US	Steve Byrne, CFA
<b>RVW</b>	Albemarle	ALB	ALB US	Steve Byrne, CFA

**iQmethod<sup>SM</sup> Measures Definitions****Business Performance**

Return On Capital Employed

Return On Equity  
Operating Margin  
Earnings Growth  
Free Cash Flow

**Quality of Earnings**

Cash Realization Ratio  
Asset Replacement Ratio  
Tax Rate  
Net Debt-To-Equity Ratio  
Interest Cover

**Valuation Toolkit**

Price / Earnings Ratio  
Price / Book Value  
Dividend Yield  
Free Cash Flow Yield  
Enterprise Value / Sales

EV / EBITDA

**Numerator**

NOPAT = (EBIT + Interest Income) × (1 – Tax Rate) + Goodwill Amortization

Net Income  
Operating Profit  
Expected 5 Year CAGR From Latest Actual  
Cash Flow From Operations – Total Capex

**Numerator**

Cash Flow From Operations  
Capex  
Tax Charge  
Net Debt = Total Debt – Cash & Equivalents  
EBIT

**Numerator**

Current Share Price  
Current Share Price  
Annualised Declared Cash Dividend  
Cash Flow From Operations – Total Capex  
EV = Current Share Price × Current Shares + Minority Equity + Net Debt + Other LT Liabilities  
Enterprise Value

**Denominator**

Total Assets – Current Liabilities + ST Debt + Accumulated Goodwill  
Amortization  
Shareholders' Equity  
Sales  
N/A  
N/A

**Denominator**

Net Income  
Depreciation  
Pre-Tax Income  
Total Equity  
Interest Expense

**Denominator**

Diluted Earnings Per Share (Basis As Specified)  
Shareholders' Equity / Current Basic Shares  
Current Share Price  
Market Cap = Current Share Price × Current Basic Shares  
Sales

Basic EBIT + Depreciation + Amortization

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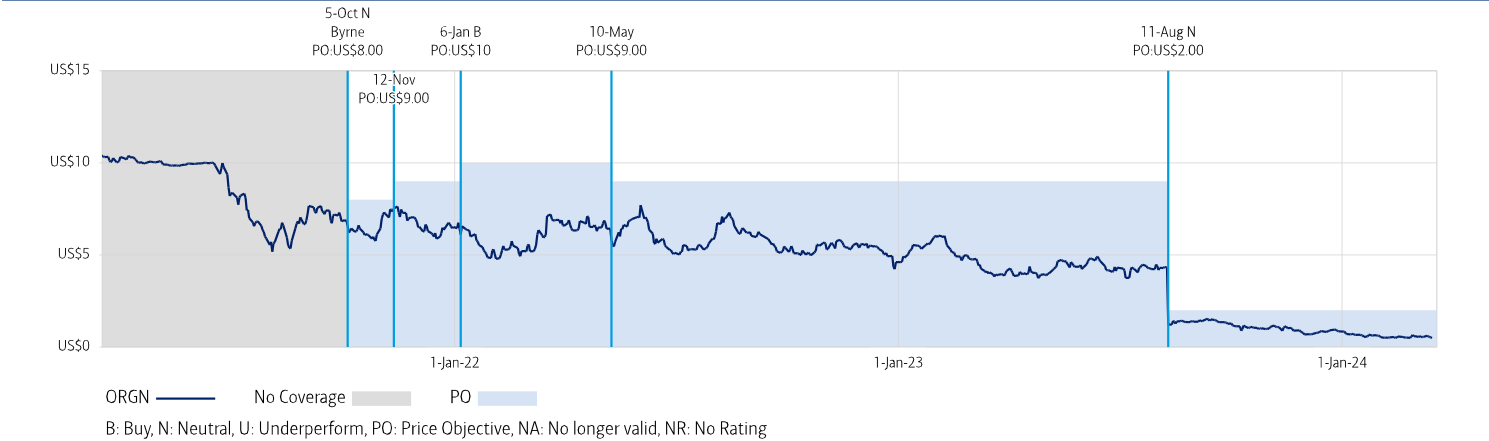
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Origin Materials (ORGN) Price Chart



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Equity Investment Rating Distribution: Chemicals Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships <sup>R1</sup>	Count	Percent
Buy	66	47.83%	Buy	33	50.00%
Hold	33	23.91%	Hold	16	48.48%
Sell	39	28.26%	Sell	20	51.28%

Equity Investment Rating Distribution: Global Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships <sup>R1</sup>	Count	Percent
Buy	1895	53.62%	Buy	1083	57.15%
Hold	832	23.54%	Hold	454	54.57%
Sell	807	22.84%	Sell	383	47.46%

<sup>R1</sup> Issuers that were investment banking clients of BofA Securities or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only stocks. A stock rated Neutral is included as a Hold, and a stock rated Underperform is included as a Sell.

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster <sup>R2</sup>
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Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

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