



## Overall Assessment

Planet Tracker's analysis shows Dow on a pathway aligned with +3°C although the company claims it is 'aligned with a 1.5°C world'. With 72% of emissions coming from Scope 3, and Dow having no Scope 3 target, it is difficult to have confidence in the management's statement. Furthermore, the management state, 'tracking and reducing Scope 3 emissions are critical to Dow's climate strategy'.

As with many other chemical companies, Dow is relying on new technologies to provide the promised emission reductions, but as the management states these are 'not yet economically available'. The executive team have little direct financial incentive to tackle this problem as only 5% of the short-term incentives are linked to sustainability and the long-term part only requires the delivery of a plan to the Board of Directors. Management state they are developing Scope 3 strategies.

With a reliance on fossil fuels as a feedstock and energy source, the company faces considerable transition risk. Presently, investors do not have the information to understand how Dow is heading to carbon neutrality in 2050.



This report is one of a series examining the climate transition plans of companies in the Climate Action 100+ list. This project is separate to and not affiliated with Climate Action 100+.

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## Climate Alignment

- Dow's total emissions were 112,028 ktCO<sub>2</sub>e in 2022, of which 25% were Scope 1, 4% were Scope 2 and 72% were Scope 3.
- Planet Tracker's analysis shows that Dow is on track to hit its target of a 15% reduction in Scope 1 & 2 emissions versus 2020, with the caveat that efficiency improvements may need to accelerate, particularly for Scope 1. There is no Scope 3 target for 2030.
- Dow targets being carbon neutral for Scope 1, 2 & 3 by 2050 "plus product benefits" for which we struggled to find a definition. About 35% of total emissions come from buying oil and natural gas for use as energy and feedstock. As with all chemical companies, it will be impossible to decarbonise the supply chain without addressing the oil and gas usage.
- There is no detailed roadmap for eliminating Scope 3 emissions and no discussion of possible technologies or other action required. We conclude that Dow is not on track to being carbon neutral by 2050.



## Policy and Governance

- Dow has both short-term (STI) and long-term incentive (LTI) plans for its CEO.
- We estimate that only 5% of the STI is allocated to emission reduction.
- The LTI has a higher proportion at 20% but most of this relates to establishing plans and exposures, not to reducing emissions.
- Our conclusion is that Dow management has minimal financial incentive to reduce carbon emissions.
- Dow is "developing Scope 3 climate strategies for all material categories" which strongly implies that such strategies are not currently finalised.



## Risk Analysis

- Dow purchased 21.5 million tonnes of feedstock in 2021, i.e. base chemicals that are turned into plastics, all derived from oil and natural gas. This has an implied CO<sub>2</sub>e footprint of about 60 million tonnes. The carbon neutral Scope 3 target is simply not credible without a detailed plan to replace all this feedstock with recycled or renewable alternatives.
- Dow has announced recycling initiatives totalling 880,000 tonnes and has a goal of 3 million tonnes by 2030. This is a long way short of the required capacity to achieve carbon neutrality for Scope 3.
- In Dow's own words, significant future emission reduction will require "new technologies [that are] not yet economically available".
- We conclude that Dow faces considerable transition risk after 2030.



## Strategy Assessment

- Chemical companies like Dow are both energy-intensive and reliant on oil and natural gas-derived feedstock.
- Our analysis concludes that Dow has yet to reveal a credible plan to become carbon neutral by 2050.

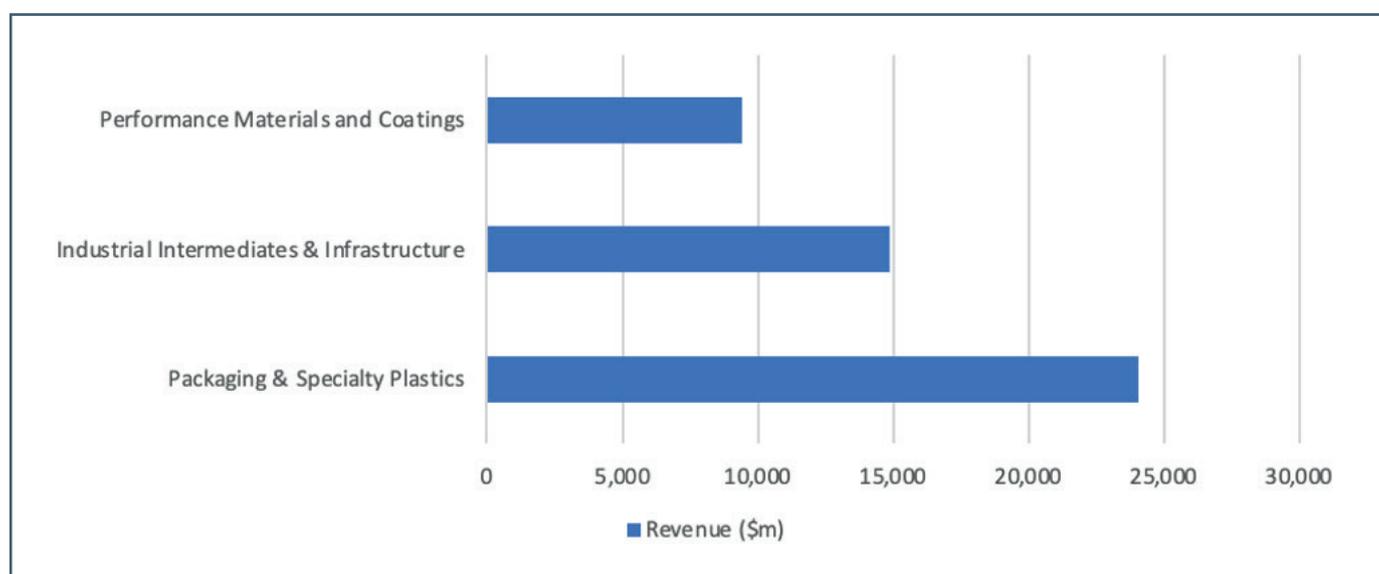
## Company Overview

Dow was demerged from DowDuPont in March 2019. The original Dow Chemical was founded in 1897. Dow is generally considered to be the second largest chemical company in the world, after BASF.

In its own words, “[Dow’s] ambition is to become the most innovative, customer-centric, inclusive and sustainable materials science company in the world. Dow’s portfolio of plastics, industrial intermediates, coatings and silicones businesses delivers a broad range

of differentiated, science-based products and solutions for its customers in high-growth market segments, such as packaging, infrastructure, mobility and consumer applications<sup>1</sup>”. Dow also describes itself as a “major user of energy<sup>2</sup>”.

Dow has three segments: Packaging & Specialty Products, Industrial Intermediates & Infrastructure and Performance Materials and Coatings – see Figure 1.



**Figure 1:** Dow revenue by segment (5-year average 2018-2022). Source Dow annual reports

The largest is Packaging & Specialty Plastics (49% of revenues on average 2018-2022). It is also the most profitable both by margin (average 16.3%) and by absolute amount (68% of clean operating profit 2018-2022) - see Figure 2

The vast majority of Scope 1 emissions – 84% in 2021 – are produced by the Hydrocarbons and Energy division, which is part of the Packaging & Specialty Products segment.

Dow’s largest end market is infrastructure (c35% of sales), followed by consumer (c30%), packaging (c25%) and mobility (c10%)<sup>3</sup>.

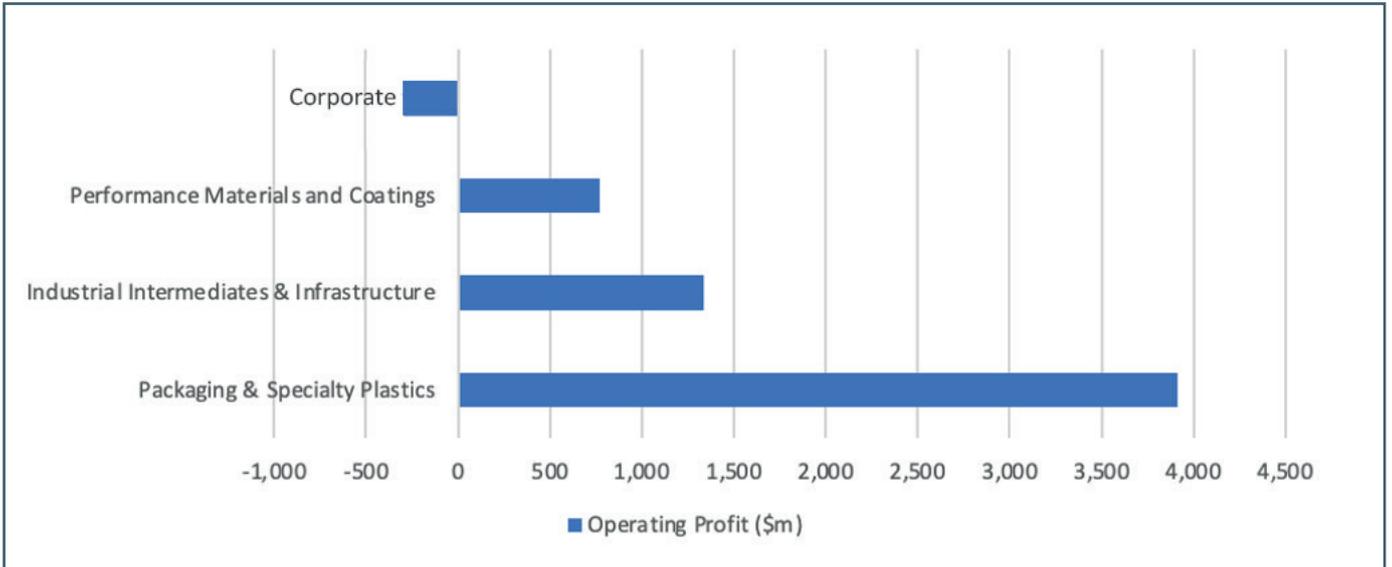
The three main segments are organised as follows

- **Packaging & Specialty Plastics** is organised into two businesses: Hydrocarbons & Energy and Packaging and Specialty Plastics.
- **Industrial Intermediates & Infrastructure** is organised into two businesses: Industrial Solutions and Polyurethanes & Construction Chemicals.
- **Performance Materials and Coatings** is organised into two businesses: Coatings & Performance Monomers and Consumer Solutions.

<sup>1</sup> Source: Dow 2023 proxy statement, page 2

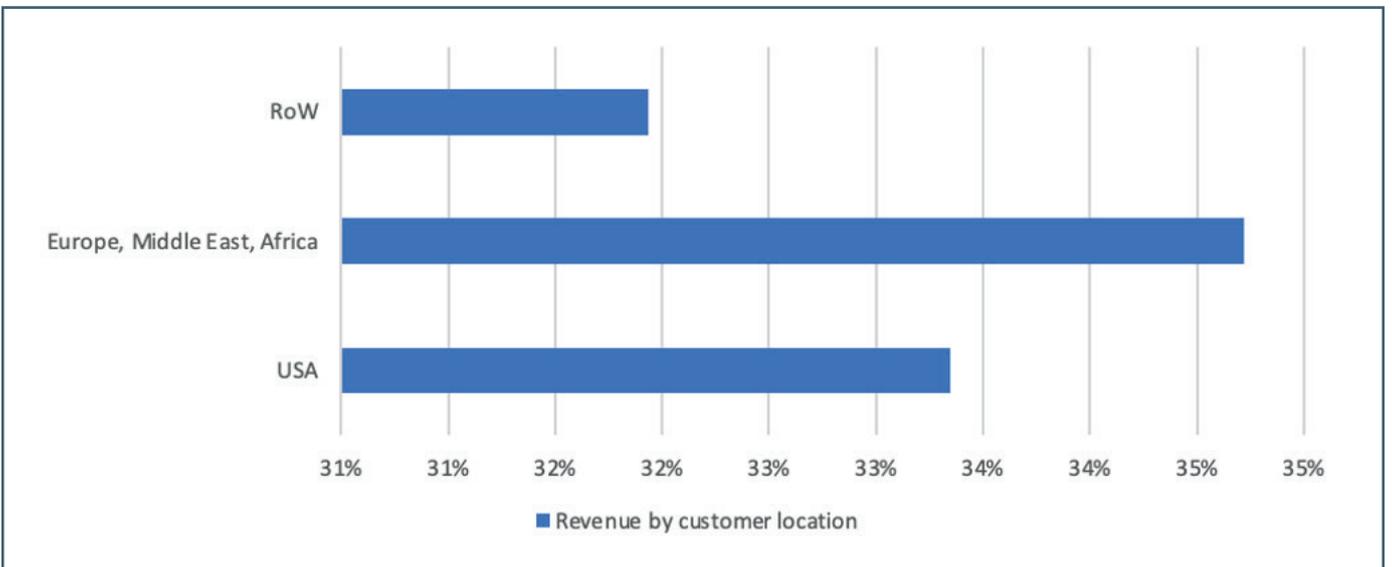
<sup>2</sup> Source: Dow 2022 CDP submission, C0.1

<sup>3</sup> Source: Dow 2022 progress report, page 8



**Figure 2:** Dow operating profit by segment (5-year average 2018-2022). Source: Dow annual reports

Dow is a global business with revenues spread between the USA, EMEA (Europe, Middle East & Africa) and Rest of World – see Figure 3.



**Figure 3:** Dow revenues by customer location (5-year average 2018-2022). Source: Dow annual reports

## Climate Alignment

### EMISSIONS INVENTORY

In 2022, Dow produced 112,028 ktCO<sub>2</sub>e of GhG emissions, split between 27,290 of Scope 1 (25% of the total), 4,190 of Scope 2 (4%) and 80,548 of Scope 3 (72%). Note that Dow's methodology changed slightly in 2022 and the two prior years, 2021 and 2020, were restated. The years 2020-2022 are therefore not strictly comparable to 2019 and earlier.

We note that 66% of all Scope 1 emissions in 2021 came from just one country, the USA, with three quarters of this coming from just 3 plants in Texas and Louisiana. We further note that 58% of Scope 2 emissions in 2021 came a single plant in Stade in Germany – see Figures 4 and 5.

Dow Scope 1 & 2 by country (2021, tonnes CO <sub>2</sub> e)	Scope 1	share	Scope 2	share
United States of America	<b>18,717,844</b>	<b>66%</b>	<b>652,898</b>	<b>11%</b>
Netherlands	<b>3,854,940</b>	<b>14%</b>	13,842	0%
Germany	<b>1,994,186</b>	<b>7%</b>	<b>4,131,275</b>	<b>73%</b>
Canada	1,080,903	4%	59,554	1%
Spain	922,233	3%	61,328	1%
Argentina	876,642	3%	125,975	2%
Brazil	292,552	1%	92,555	2%
United Kingdom	178,595	1%	0	
Rest of world	146,737	1%	119,214	2%
Thailand	127,818	0%	<b>205,129</b>	<b>4%</b>
China	50,977	0%	195,925	3%
Portugal	50,329	0%	20,948	0%
<b>total</b>	<b>28,293,756</b>	<b>100%</b>	<b>5,678,643</b>	<b>100%</b>

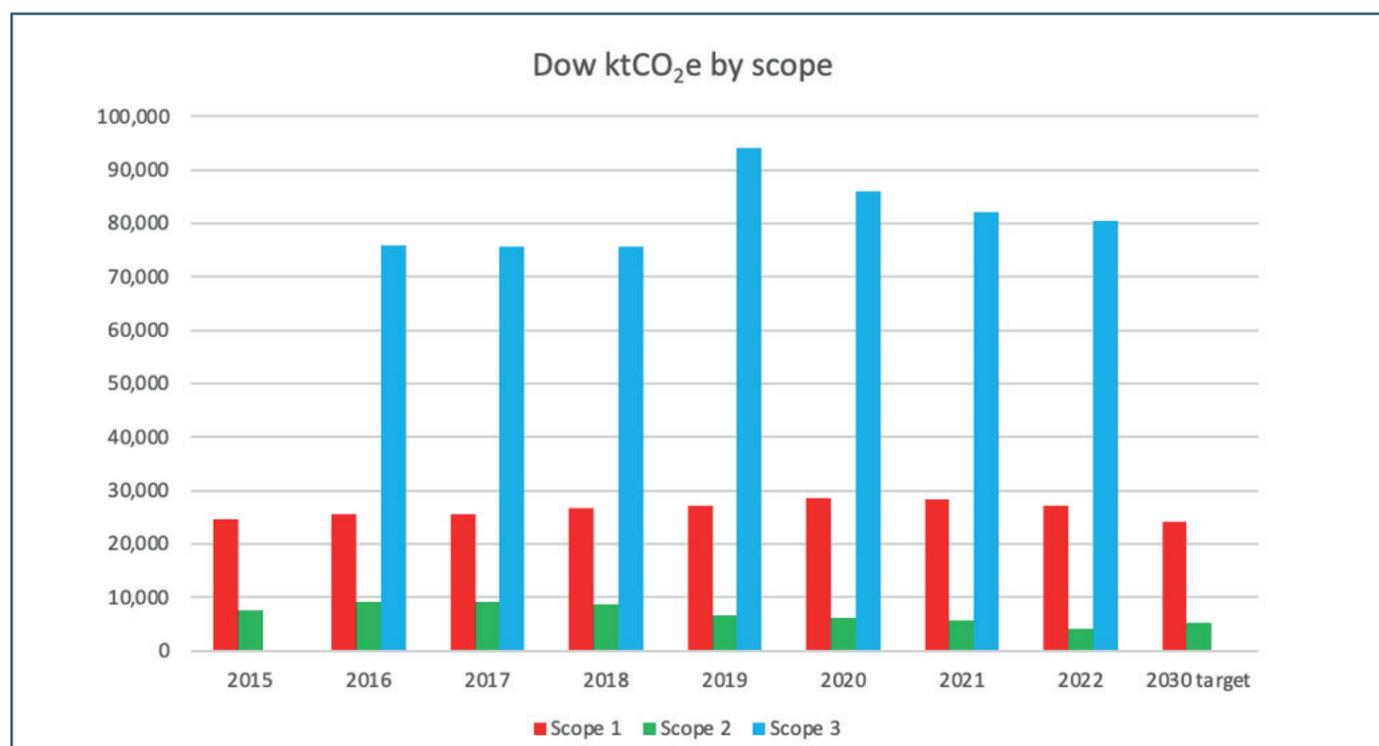
**Figure 4: Dow GhG emissions by Scope and country (tonnes CO<sub>2</sub>e, 2021). Source: Dow CDP submission 2022**

Dow Scope 1 & 2 by country (2021, tonnes CO <sub>2</sub> e)	Scope 1	share	Scope 2	share
FREEPORT, TX	5,969,309	21%	57,104	1%
PLAQUEMINE, LA	5,170,573	18%	3	0%
TERNEUZEN, NLD	3,842,795	14%	2,373	0%
ST. CHARLES OPERATIONS	2,950,145	10%	35,662	1%
SABINE, TX	2,411,763	9%	6,462	0%
DOW CENTRAL GERMANY, DEU	1,294,521	5%	787,526	14%
FORT SASKATCHEWAN, CAN	1,010,925	4%	11,890	0%
STADE, DEU	681,664	2%	3,270,537	58%
DEER PARK, TX	629,437	2%	19,125	0%
REST OF THE WORLD	4,291,238	15%	1,282,841	23%
ZHANGJIAGANG, CHN	41,386	0%	205,120	4%
<b>total</b>	<b>28,293,756</b>	<b>100%</b>	<b>5,678,643</b>	<b>100%</b>

**Figure 5:** Dow GhG emissions by Scope (tonnes CO<sub>2</sub>e, 2021). Source: Dow CDP submission 2022

Dow's disclosure is generally good, and we have Scope 3 data going back to 2016 – see Figure 6.

However we note that the methodology has not been consistent over time, which hampers our ability to analyse longer-term trends<sup>4</sup>.

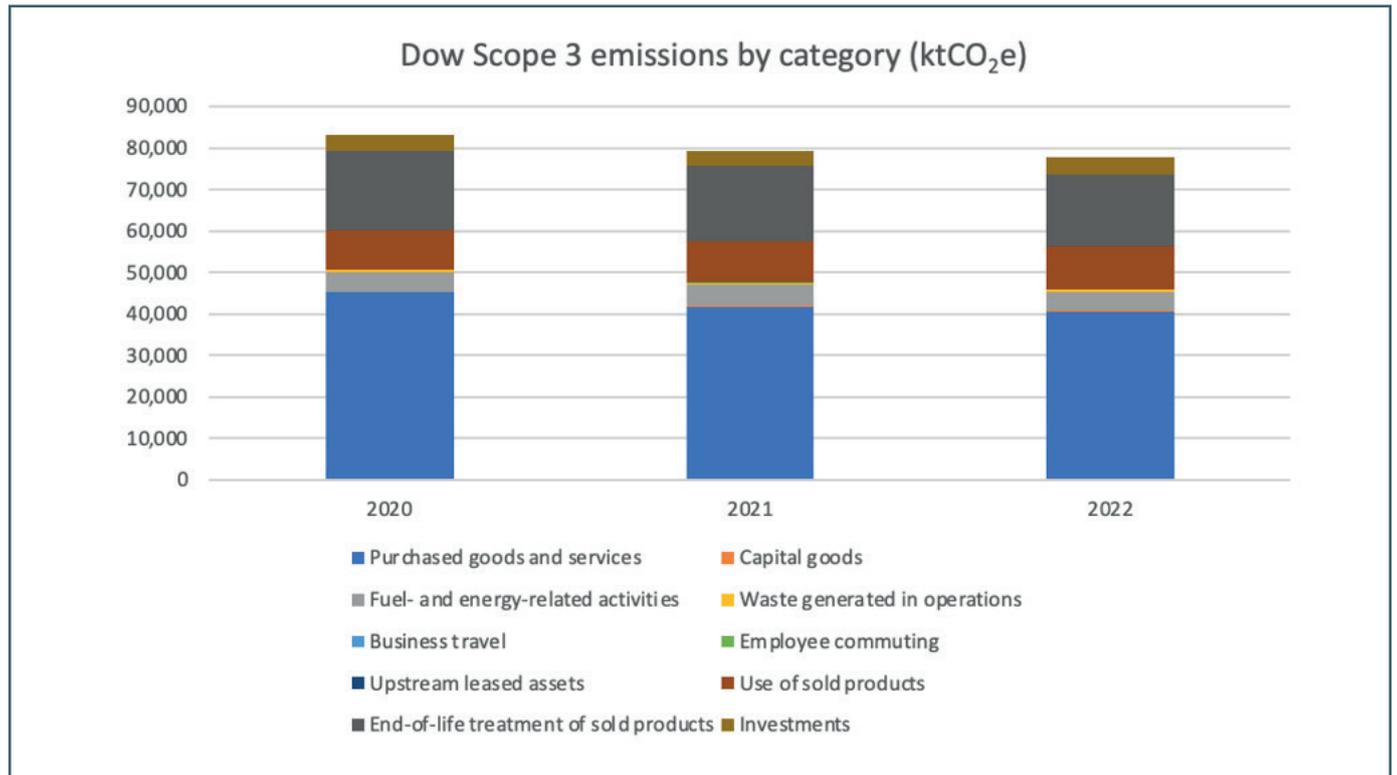


**Figure 6:** Dow GhG emissions by Scope (tonnes CO<sub>2</sub>e, 2021). Source: Dow CDP submission 2022

<sup>4</sup> For example, emissions from 'fuel and energy-related activities' in the 2020 CDP submission (i.e. calendar year 2019) were 8,269,874 tonnes versus 863,304 tonnes in the 2019 submission.

The largest single source of GhG emissions is ‘purchased goods and services’, which accounted for 36-37% of total emissions in the 2020-2022 period or 50-53% of Scope 3. Dow adds that “approximately 60% of Dow’s Scope 3 emissions come from upstream emissions, which mainly result from purchased raw materials and transportation<sup>5</sup>”.

As transportation is just 3% of Scope 3, we can assume that almost all the ‘purchased goods and services’ are actually purchased raw materials – see Figure 7.



**Figure 7: Dow Scope 3 GhG emissions category (ktCO<sub>2</sub>e, 2021).**  
Source: Dow CDP submission 2022 Progress Report, page 129

In other words, about 55% of Scope 3 and 35% of total GhG emissions come from purchased raw materials. This is a typical scenario for many chemical companies, which use oil and natural gas as both fuel and feedstock. It also underlines the importance of working with suppliers to reduce scope 3 emissions.

It is simply impossible to fully de-carbonise chemical production without de-carbonising the purchased raw materials.

Dow also sells methane to third parties, 70% of which is natural gas that Dow purchases and resells to tenants on Dow’s sites. Total methane sales were 1.44 million tonnes in 2021.

5 Dow 2022 Progress Report, p129

### Another way of looking at Scope 3 emissions

Dow purchased 21.5 million tonnes of feedstock in 2021, split across four product types - see Figure 8. These are the raw materials that Dow turns into plastics. The CHP submission includes the 'inherent CO<sub>2</sub> emission factor', which is a way of estimating the carbon footprint of chemical feedstocks on a tonne-for-tonne basis.

Using this formula, we calculate that the carbon footprint of Dow's feedstock was about 64.3 million tonnes of CO<sub>2</sub>e in 2021, or about 75% of total declared Scope 3 emissions or 55% of all emissions in that year. We should add that this is not the methodology that Dow uses to calculate its Scope 3 emissions, but it is still an interesting insight.

Dow feedstock consumption (2021)	tonnes	CO <sub>2</sub> factor	Implied CO <sub>2</sub> e emission
Naphtha	5,847,00	3.08	18,008,760
Liquid propane	5,025,000	3.00	15,075,000
Ethane	9,945,000	2.93	29,138,850
Butane	672,000	3.03	2,036,160
<b>total</b>	<b>21,489,000</b>		<b>64,258,770</b>

**Figure 8:** Dow feedstock analysis (tonnes CO<sub>2</sub>e). Source: Dow 2022 CDP C-CH8.3a

There is one very simple takeaway from this analysis. If Dow is serious about getting to net zero by 2050, then it has to replace at least 21.5 million tonnes of non-renewable feedstock with recycled or renewable raw material.

We say 'at least' as Dow is planning to grow its volumes in future years so the 21.5 million should increase over time. Dow's current plans for recycled feedstock total approximately 880,000 tonnes by 2030, which represent about 4% of current feedstock. These numbers are not strictly comparable, but it gives a sense of the scale of the challenge.

**EXTERNALITIES AND TARGETS**

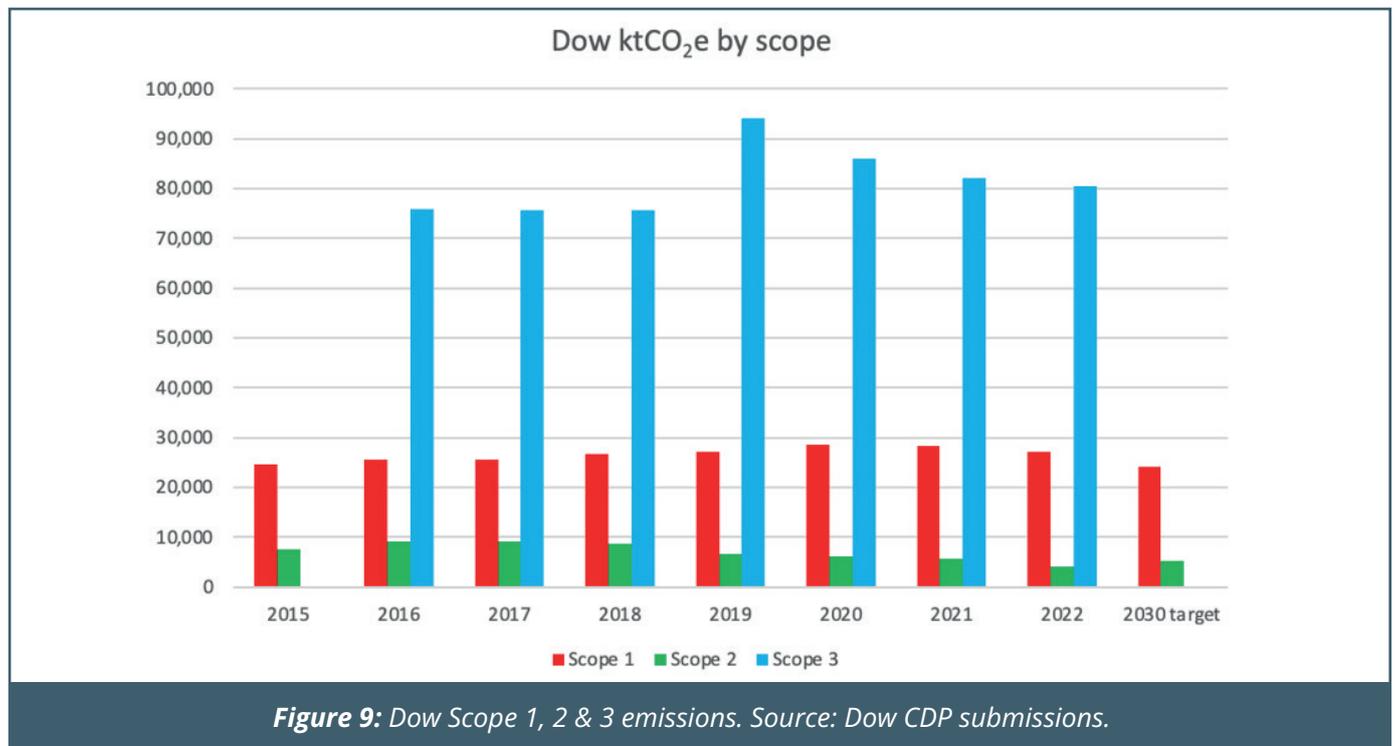
Dow claims to be on a transition path “that aligns with a 1.5°C world<sup>6</sup>”, although the trajectory out to 2030 is aligned with a warmer 2.0°C world. This means that Dow will need to accelerate its reforms from 2030 onwards if it is to hit its 2050 carbon neutral target.

Dow has several GhG-related targets:

- **2025:** 750MW of electricity purchased from renewable sources. This target has already been exceeded<sup>7</sup>. Dow purchased 1,036MW in 2022<sup>8</sup>.
- **2025:** 85% of R&D to be spent on low-carbon products or services. This target was hit in 2021<sup>9</sup>.
- **2030:** reduce Scope 1 & 2 net emissions by 5,000 ktCO<sub>2</sub>e or 15% compared to 2020<sup>10</sup>. Dow considers this to be 2.0°C aligned<sup>11</sup>. Note that this target does not cover Scope 3 emissions. Dow expects its volumes to grow by c20% from 2020 to 2030<sup>12</sup> so the 15% absolute reduction is more ambitious than it sounds; it equates to a reduction in carbon intensity of about 30%.

- **2030:** Dow will “commercialize 3 million metric tons of circular and renewable plastic solutions every year by 2030”<sup>13</sup>. To do this, Dow will expand its efforts to ‘stop the waste’ by building industrial ecosystems to collect, reuse or recycle waste and expand its portfolio to meet “rapidly growing demand”. The split between circular and renewable is not disclosed but appears to be heavily biased towards renewable.
- **2035:** “Dow will help ‘close the loop’ by having 100% of Dow products sold into packaging applications be reusable or recyclable”<sup>14</sup> by 2035.
- **2050:** Dow aims to be carbon neutral across Scope 1, 2 & 3 “plus product benefits”. Interestingly, Dow is currently “unsure” whether this target will involve permanent carbon removal, e.g. Carbon Capture & Storage (CCS)<sup>15</sup>.

Dow includes Scope 1 & 2 emissions from its non-consolidated affiliates in its Scope 3 disclosure under ‘investments’<sup>16</sup> – see Figure 9.



6 Source: Dow 2022 CDP submission, C3.1  
 7 Source: Dow 2022 CDP submission, C4.2b  
 8 Source: Dow Progress report, p202  
 9 Source: Dow 2022 CDP submission, C4.2b  
 10 Source: Dow 2022 CDP submission, C4.1a  
 11 Source: Dow 2022 CDP submission, C4.1a

12 Source: Dow 2022 Progress report, page 14  
 13 Source: Dow 2023 proxy statement, page xii  
 14 Source: Dow 2022 CDP submission, C3.3  
 15 Source: Dow 2022 CDP submission, C4.1a  
 16 Source: Dow 2022 Progress Report, page 129

## Scope 1 & 2 progress

Dow's Scope 1 emissions in 2022 were 4% lower than 2020. Scope 2 volumes fell by an impressive 33% but are a smaller proportion of total emissions. Combined Scope 1 & 2 fell by 9% versus the 2030 target of a 15% reduction. On the face of it, Dow looks to be on track for the 2030 target.

On closer examination, the news is a bit less positive. Three years is too short a period to extrapolate and 2020 and 2021 were distorted by COVID effects. Another way to look at this issue is to consider the required improvement in energy intensity.

Dow plans to grow volumes by 20% over the 2020-2030 period and reduce emissions by 15% at the same time. This implies a reduction in energy intensity (the energy in GJ required to produce a ton of production) of about 30%, roughly 3% per annum.

This number is not precise but gives an indication of what is required. Energy intensity will vary from year to year depending on utilisation rates, product mix, geographical mix and many other factors.

Dow's energy intensity improved from 11.9 in 2020 to 11.4 to 2022, a fall of 4% over 2 years. This is below the 3% per annum figure we estimated above, but with the caveat that there are many factors at play.

Overall, we conclude that Dow is probably on track to hit its 2030 Scope 1 & 2 target, but that the rate of efficiency improvements may need to increase, particularly for Scope 1.

## Scope 3 in more detail

In Dow's own words, *"tracking and reducing Scope 3 emissions are critical to Dow's climate strategy"<sup>17</sup>* but there is little visible information about how Dow intends to get there. For example, the 2022 progress report talks about *"working with suppliers on upstream decarbonization opportunities, aligned with our Supplier Code of Conduct"<sup>18</sup>* which we find uninformative.

Later in the report, Dow adds that it is *"actively working to set a Scope 3 target/baseline while also working to enhance its processes and value chain engagement to ensure transparent reporting and identification of emission reduction opportunities"<sup>19</sup>*. Dow is also working with the Science-based Target initiative (SBTi) to develop a *"chemical sector-specific decarbonization guideline that we expect will reflect the technical challenges and realities of the chemical sector"<sup>20</sup>*.

These statements lack detail.

Taken together, our conclusion is that Dow's 2050 net zero Scope 3 ambition is not supported by a detailed roadmap and is currently just an aspiration.

17 Dow 2022 Progress Report, p129

18 Dow 2022 Progress Report, p15

19 Dow 2022 Progress report, p191

20 Dow 2022 Progress Report, p15

## Policy and Governance

### ENGAGEMENT AND INFLUENCE

#### Suppliers' Engagement

Dow's upstream Scope 3 emissions were 72% of total GhG emissions in 2022 and stem mainly from purchased raw materials. Reducing supplier emissions is therefore the single biggest opportunity to reduce Dow's carbon footprint.

As we discussed above, Dow purchased 21.5 million tonnes of feedstock in 2021. This is all sourced from oil or natural gas, i.e. from non-renewable sources. These are also very carbon-intensive raw materials, with a 3:1 carbon footprint. In other words, each tonne of feedstock generates about 3 tonnes of CO<sub>2</sub>e emissions during its production.

By far the biggest challenge facing Dow from a GhG perspective is replacing this feedstock with renewable or recycled feedstock. We have not been able to locate any concrete plans to do this on the scale that is necessary.

The 2022 CDP submission states that "Dow recognizes the need to reduce value chain emissions to mitigate climate-related risk". It adds that this "consists of both internal activities to actively manage and reduce our impact as well as external engagement to drive and promote climate action<sup>21</sup>". This implies that the Scope 3 strategies are currently not developed, which supports our overall assessment.

#### Other Value Chain Partners' Engagement

Dow has a stated policy of "developing low-carbon products, technologies and services for our customers"<sup>22</sup>.

As discussed above, Dow recognises the need to act, but provides very few details about planned actions.

### MANAGEMENT ALIGNMENT

"The CEO is ultimately responsible for reporting to the Board on climate related risks and opportunities<sup>23</sup>." We are going to focus on CEO compensation, partly because of this sentence but also because it is our normal practice. We will look at base salary and variable pay but ignore other benefits such as pension contributions.

There are two variable compensation or bonus plans:

- **Short-Term Incentive (STI)<sup>24</sup>**. Dow calls this the "Performance Award". The 2022 award was split 40/40/20 into Operating EBIT, Free cash Flow and ESG metrics. The combined score is then multiplied by an individual factor of 0-125%. The maximum payout is capped at 200% of base salary.

- **Long-Term Incentive (LTI)<sup>25</sup>**. The LTI is a long-term plan with 50% vesting after 3 years and 50% after 5 years. The latest plan is 80% based on financial metrics and 20% on 'carbon emissions reduction metrics'.

#### The STI in more detail

The CEO's individual factor was assessed at 122% for 2022, close to the maximum score of 125%. This factor is assessed by the 'Compensation and Leadership Development Committee' and appears to be a subjective judgment; no underlying calculation is disclosed.

21 Source: Dow 2022 CDP submission, C3.3  
22 Source: Dow 2022 CDP submission, C0.1  
23 Source: Dow 2022 CDP submission, C1.2a

24 Source: Dow 2023 Proxy Statement p 6  
25 Source: Dow 2023 Proxy Statement p 68

The target amount for the CEO STI is set at 175% of base salary for the year, which can be increased by the individual factor of 125%, giving a theoretical maximum of 219%. The total payout is however capped at 200%.

The ESG metrics are 20% of the STI. For 2022, there are 5 ESG metrics, only one of which includes sustainability. The 'sustainability' component actually includes diverse measures such as safety, worker health and transportation stewardship. The other 4 metrics are for Customer Experience and Inclusion & Diversity. We conclude that emission reduction performance is, at best, about 5% of the STI.

### The LTI in more detail

The LTI is 20% based on 'carbon metrics'. For 2022, this meant:

- **Establish** carbon emissions reduction plans for the top 25 sites by the end of 2022. This metric was achieved. The plans are not public as far as we know.

- **Define** Scope 3 carbon emissions exposures for three categories of Scope 3 emissions by the end of 2023. The three categories are 1) Purchased goods and services, 2) Fuel and energy-related activities, and 3) Transportation/distribution. The categories cover 98% of 2022 upstream Scope 3 emissions and 59% of total Scope 3. It is not clear what 'defining exposures' means in practice
- **Achieve** cumulative carbon emissions reduction target goal for Scope 1 & 2. This appears to be based on whether Dow is on track for the 2030 target.

The relative weight of the three metrics is not disclosed. We also note that two of the metrics are based on defining plans and exposures, not on delivering any physical improvements.

Our overall conclusion is that Dow management has minimal financial incentive to reduce carbon emissions. The STI has only 5% allocated to emission reduction. The LTI has a higher proportion at 20% but most of this relates to establishing plans and exposures, not to reducing emissions.

## Risk Analysis

### FINANCIAL IMPACT

Dow states that all the “contemplated” bans on single-use plastics cover 3.5% or less of global plastic demand and less than 2% of Dow’s 2022 revenue<sup>26</sup>. On this basis we assess that the current near-term financial risk to Dow shareholders from banning single use plastic is low. This may change if much more comprehensive bans are considered.

There is considerable potential risk from other regulatory developments, but this is by definition impossible to quantify.

### TECHNICAL RISK

As discussed elsewhere, reaching carbon neutrality for Scope 3 by 2050 necessitates major technical change, notably replacing oil and gas feedstock with renewable or recycled alternatives. Dow is investing in recycling, but the scale is small compared to the quantities needed.

There is no detail about how Dow plans to reach carbon neutrality for Scope 3 and we consider the technical risks to be high. Technologies do exist for replacing oil and gas-based feedstock, but they are not currently commercially proven. The lack of detail is by itself very telling as we are confident that Dow would be talking about the details if they existed.

The hurdles that Dow faces are common across most chemical companies, as is the absence of detailed plans to become carbon-neutral.

The 2022 CDP submission states that *“though Dow continuously looks for opportunities to reduce the energy and emissions intensity of our operations, many of our assets have been optimized such that, in order to achieve further significant step-changes in emissions, new technologies not yet economically available will need to be implemented<sup>27</sup>”*. This strongly supports our view that future technical risk is high.

26 Source: Dow 2022 Progress Report, page 25

27 Source: Dow 2022 CDP submission, C2.2a

## Strategy Assessment

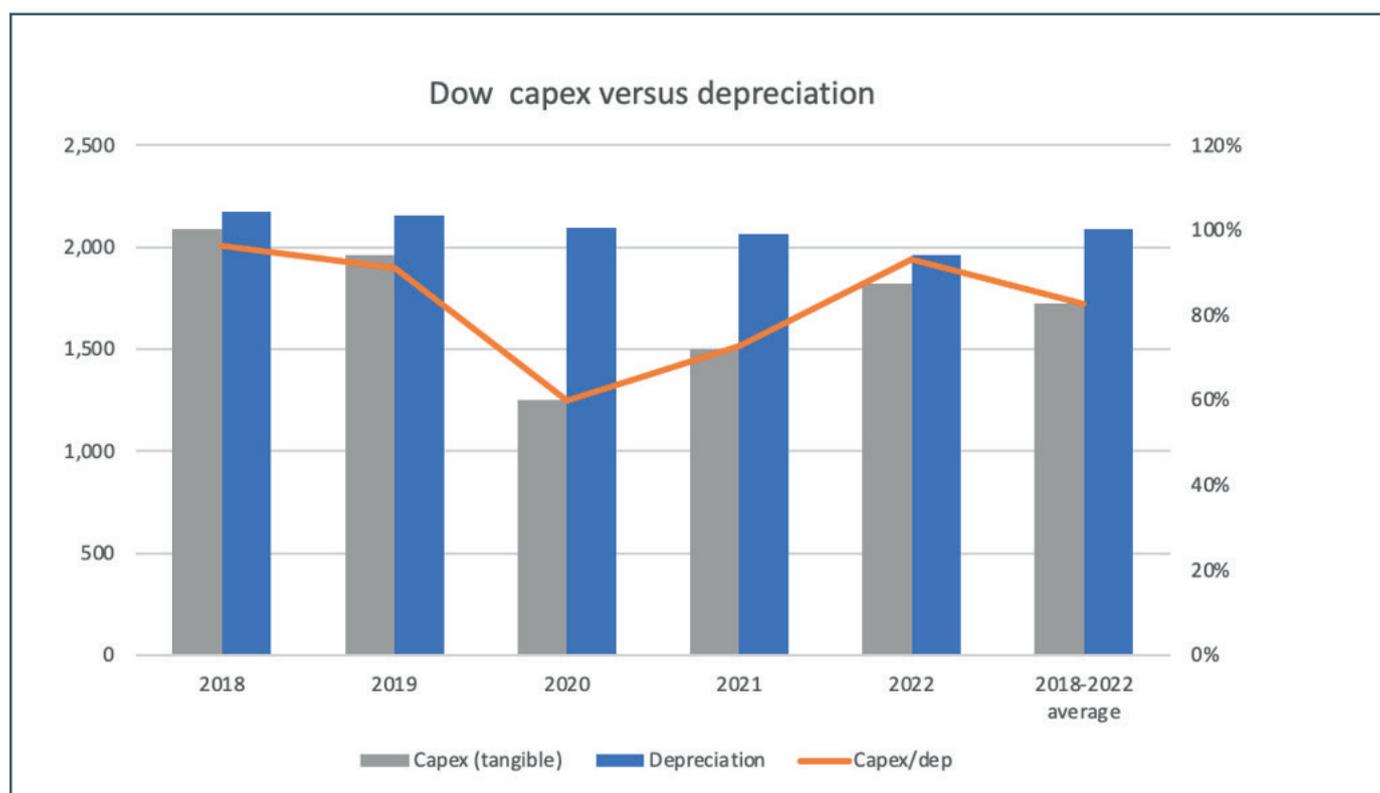
### CAPITAL ALIGNMENT

Dow was spun out of DowDuPont in April 2019. We have financial results for the last 5 years, including pro forma numbers for 2018. After the separation, the 'new' Dow cut capital expenditure very sharply in 2020, to just 60% of depreciation<sup>28</sup>. Capex has been rising steadily since then, reaching 93% of depreciation in 2022 – see Figure 10.

Going forward, Dow expects "to invest approximately USD 1 billion annually across the economic cycle to drive both growth and decarbonization of our manufacturing assets, which is well in line with the capital outlay that we want to maintain around depreciation and amortization levels through the economic cycle<sup>29</sup>".

The CDP report adds that "Dow expects to allocate [approximately] USD 1 billion of capex annually for such projects – or approximately 1/3 of its depreciation and amortization levels – to decarbonize its global asset base in a phased, site-by-site approach<sup>30</sup>".

It is not clear how much of the USD 1 billion is for decarbonisation and how much is for volume growth.



**Figure 10:** Dow capital expenditure and depreciation, tangible assets only (USD million).  
Source: Dow annual reports.

28 A capex/depreciation ratio above 1.0x implies that a company is continuing to invest in its future. A ratio below 1.0x implies that a company is reducing investment, either because it thinks future returns are unattractive and/or because it thinks it has over-invested in the past. The annual depreciation charge is a notional accounting cost and tends to be stable over the short-term so a volatile capex/depreciation ratio implies that either the business is cyclical or that investments are large and lumpy.

29 Source: Dow 2022 Progress Report, page 14

30 Dow 2022 CDP submission, C2.4a

The 2022 progress report adds that *"We have a detailed investment plan and roadmap to our 2050 carbon-neutrality target that touches nearly every aspect of our business, focusing on the following five key areas<sup>31</sup>":*

1. *"Optimizing Our Manufacturing Facilities and Processes for Sustainability"*. This is Scope 1 and therefore largely under Dow's direct control.
2. *"Increasing Use of Clean Energy and Steam"*. This is likely mainly Scope 2.
3. *"Investing in Transformative, Next-Generation Manufacturing Technology"*. This is Scope 1, but the text is uninformative.
4. *"Developing Low-Carbon Products and Services"*. This is downstream Scope 3 but again lacks detail.
5. *"Building a Value-Generating Scope 3 Decarbonization Pathway"*. This is the main challenge as Scope 3 was 72% of total emissions in 2022. The lack of any 2030 Scope 3 target and the aim of 'building a pathway' strongly implies that Dow does not have a detailed and credible plan to eliminate Scope 3 emissions at the moment.

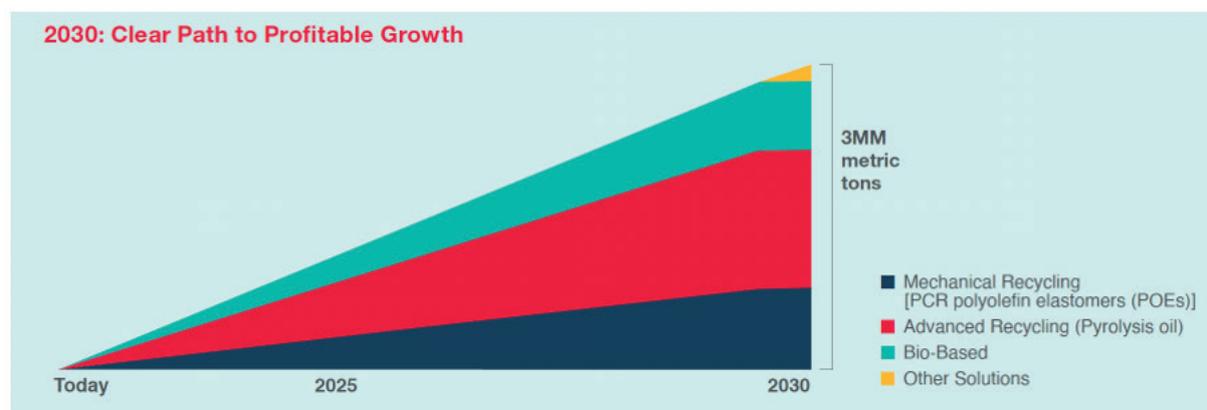
Dow is investing in reducing single-use plastics and the 2023 proxy statement highlights:

- Advanced recycling partnerships with Mura Technology to construct world-scale advanced recycling facilities in the U.S. and Europe with a total capacity of approximately 600,000 metric tons by 2030; as well as Gunvor Petroleum Rotterdam and New Hope Energy to purify and supply feedstocks derived from plastic waste, to be used to produce circular plastics;

- A new collaboration with Waste Management to improve residential plastic films recycling in the U.S and divert more than 120,000 metric tons of plastic film from landfills by 2025;
- The launch of the Closed Loop Circular Plastics Fund, managed by US-based circular plastic investment firm Closed Loop Partners, in partnership with LyondellBasell and Nova Chemicals, to invest in scalable recycling technologies, equipment upgrades and infrastructure solutions;
- Investments in several companies to support the recovery of plastic waste and recycling efforts, including Circulate Capital's Ocean Fund - the first fund and incubator dedicated to preventing ocean plastic contamination; collaboration with Mr. Green Africa, enabling diversion of 90,000 metric tons of plastic waste to be recovered and recycled into new applications over 4 years; and Valoregen to contribute to building the largest single hybrid recycling site in France, which will have capacity to process up to 70,000 metric tons of plastic waste per year;
- These initiatives total 880,000 tonnes of recycling. It is not clear that all of this will be for use as feedstock by Dow.

We have no information on the sums being invested and the declared tonnages are modest.

There is more information in graphical form in the 2022 Progress report. This shows the addition of 3 million tonnes of recycling by 2030, over three times the initiatives announced to date – see Figure 11.



**Figure 11:** Dow plans to add 3 million tonnes of recycled and renewable feedstock supply by 2030.  
Source: Dow 2022 Progress Report, page 23

We have not been able to locate Dow's annual production output in tonnes directly, but we can derive it from other data. In 2022, Dow consumed 564 million GJ of energy, almost all from purchased energy and feedstock<sup>32</sup>. Dow also discloses its energy intensity, which was 11.4 GJ per tonne of production<sup>33</sup>.

We can therefore estimate that Dow's production output was about 49 million tonnes in 2022, including by-products and co-products. The partnership with Mura that Dow highlights represents just 1.2% of Dow's current production volume. The four initiatives above amount to 1.8%. We also note that Dow purchased 21.5 million tonnes of feedstock in 2021.

Dow announced in 2021 the development of world's first zero-carbon integrated ethylene cracker and derivatives site in Fort Saskatchewan, Alberta.

Dow launched a 'Business Impact Fund' in 2016 to "address critical social challenges and advance sustainability solutions<sup>34</sup>". We note that it has given out 51 grants totalling USD 10 million over the last 7 years, which equates to less than 0.1% of annual capital expenditure. We applaud the promotion of sustainability solutions but are disappointed by its scale.

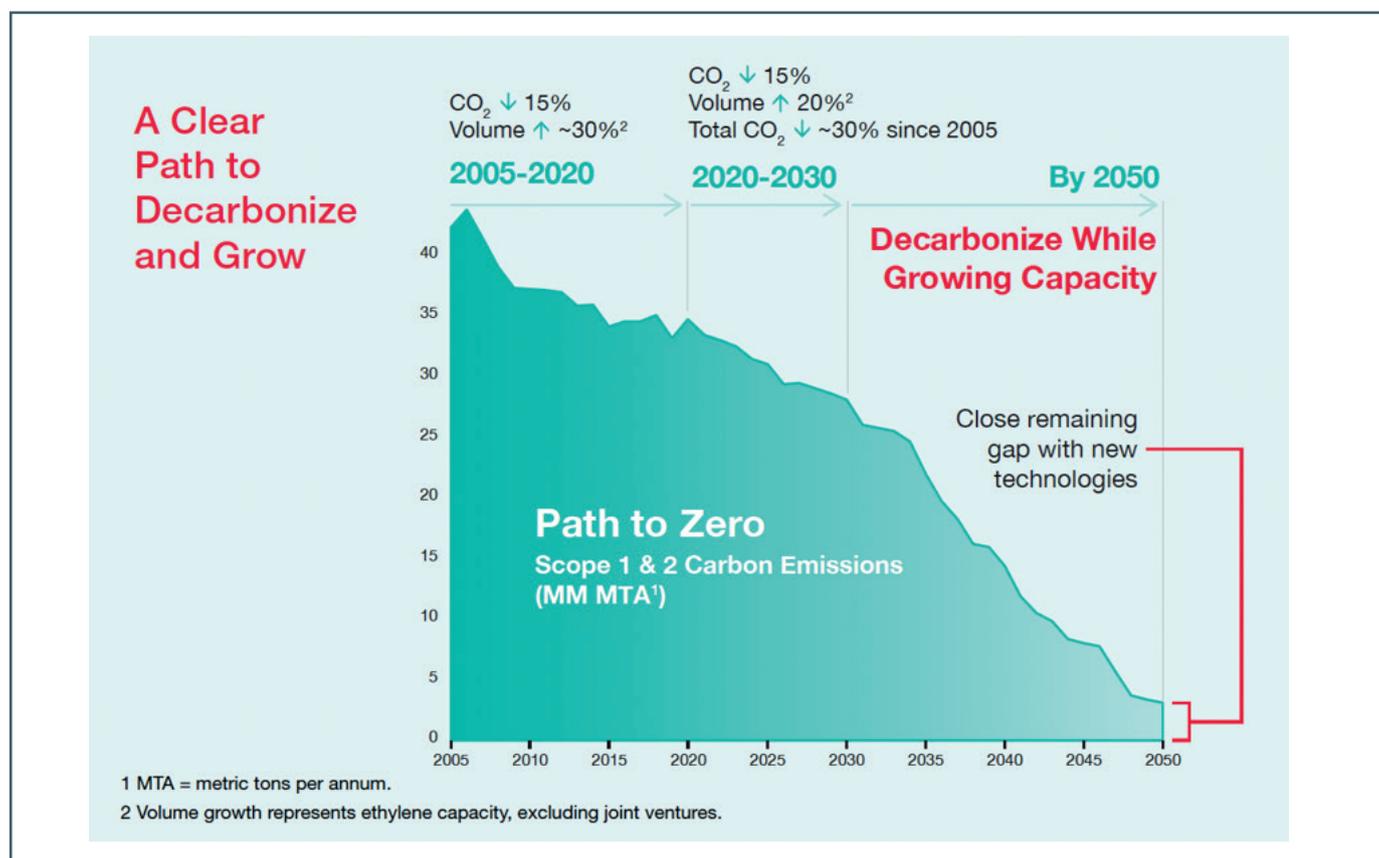
32 Source: Dow Progress Report, page 114

33 Source: Dow Progress Report, page 115

34 Source: Dow Progress Report, page 61

## TRANSITION APPRAISAL

The closest Planet Tracker could find to a roadmap to becoming carbon neutral by 2050 was a graphic on page 14 of the 2022 Progress Report - see Figure 12.



**Figure 12:** This is the only information we have about how Dow intends to become carbon neutral by 2050. Note that this is Scope 1 & 2 only. Source: Dow 2022 Progress Report, page 14

We note that:

- The rate of decarbonising is expected to accelerate after 2035.
- There is expected to be a gap of 3-4 million tonnes by 2050 which will require 'new technologies' to close. This implies that all the other anticipated progress out to 2050 does NOT require new technologies, which lacks credibility in our view.
- We may be guilty of over-analysis here, but the line in the graphic is not smoothed, which is unusual. It is possible that there are detailed plans behind this line which have not been disclosed.
- Finally, this graphic is for Scope 1 & 2 only. We have been unable to locate any information for Scope 3.

**Our overall assessment is that Dow does not have a credible roadmap to become carbon neutral by 2050.**

### End note

Planet Tracker sent a draft of this report to Dow Investor Relations Department three times between 10 August and 12 September 2023. The company chose not to respond.



## ABOUT PLANET TRACKER

Planet Tracker is a non-profit financial think tank producing analytics and reports to align capital markets with planetary boundaries. Our mission is to create significant and irreversible transformation of global financial activities by 2030. By informing, enabling and mobilising the transformative power of capital markets we aim to deliver a financial system that is fully aligned with a net-zero, nature-positive economy. Planet Tracker proactively engages with financial institutions to drive change in their investment strategies. We ensure they know exactly what risk is built into their investments and identify opportunities from funding the systems transformations we advocate.

## PLANET TRACKER'S CLIMATE TRANSITION ANALYSIS – CHEMICAL COMPANIES

As part of its material system transition programme, Planet Tracker is examining the transition plans of the chemical companies covered by the [Climate Action 100+ list](#). Our goal is to provide investors with the key information and analysis they need to be able to hold chemical companies to account for the quality of their climate transition plans and their execution against those plans, and to encourage them to use this information to engage effectively with these companies with the ultimate aim of driving the sustainable transformation of the chemical sector.

## ACKNOWLEDGEMENTS

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