Aligning with 1.5°C: a benchmark for the chemical sector

Assessment of LyondellBasell

Contents

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What is the purpose of this report?

This report assesses whether LyondellBasell is aligned with 1.5°C

The window of opportunity to limit global warming to 1.5°C is closing. The Intergovernmental Panel on Climate Change (IPCC) is clear that higher warming would increase the chance and severity of a range of climate risks.[i] 'Overshoot' – exceeding 1.5°C to return to this temperature later - must also be avoided. To quote the IPCC: "Very different impacts result from pathways that remain below 1.5°C versus pathways that return to 1.5°C after a substantial overshoot, and when temperatures stabilize at 1.5°C versus a transient warming past 1.5°C (medium confidence)."[ii]

There is still time to act, but the chemical sector must act quickly. To align with pathways to 1.5°C the sector must achieve immediate, steep and sustained emissions reductions.[iii] The long life of industrial assets means the sector is only one investment cycle away from 2050: companies must make critical decisions now.

ShareAction has produced a benchmark for the chemical sector that sets clear, measurable and evidence-based standards for alignment with the goal of limiting global warming to 1.5°C. This report will use the benchmark to assess LyondellBasell, "one of the largest plastics, chemicals and refining companies in the world."[iv]

Why was LyondellBasell selected for assessment?

ShareAction selected LyondellBasell for assessment because it is a major company in the global sector. It was not chosen based on any judgement about the company's climate performance relative to its peers. In many respects, including the nature of its operations, targets and strategy, LyondellBasell is similar to its peers.

This is the first of several uniform assessments of major European chemical companies that ShareAction will publish.

A late stage draft of part two of this report was shared with LyondellBasell before publication to check for accuracy.

What does this report cover?

Part one of this report summarizes our findings on how LyondellBasell performed against the benchmark, and what these findings mean for the company and its investors. It recommends questions that investors should ask the company about how it will improve its climate performance.

Part two is the full assessment of LyondellBasell against the benchmark. Each of the 11 sections assesses a different area of LyondellBasell's climate performance in detail against a standard set by ShareAction. The **Appendix** contains calculations referenced in this report.

Part 1: Summary of findings

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Why does LyondellBasell need to align with 1.5°C?

LyondellBasell, and the sector, must transform rapidly to limit global warming to 1.5°C

With an annual revenue of 46 billion USD and operations on three continents[v] LyondellBasell is "one of the largest plastics, chemicals and refining companies in the world."[vi] It is the single largest producer of polyethylene and polypropylene in Europe, and the second largest in North America.[vii]

LyondellBasell has a significant carbon footprint. Like all petrochemical companies it consumes fossil fuels for energy and as feedstocks:

- **For energy**: fossil fuels are burned to produce electricity and heat;
- **As feedstocks**: fossil fuels are used as a source of hydrogen and carbon, the ingredients to make chemicals. Fossil carbon is released either as a by-product of chemical production processes (if there is excess) or when fossil carbon is embodied in chemical products and released downstream. For example, when a plastic bottle is incinerated**;** and
- **Both** uses drive oil and gas extraction, which creates methane emissions upstream.

LyondellBasell's use of fossil feedstocks creates emissions upstream and downstream of its operations. The company estimates that 70 per cent[1] of its emissions are from the purchase of goods and services, and the use and disposal of its products – in other words, upstream largely

[1] Scope 3 categories 1, 10, 11. See technical appendix for workings.

from the purchase of fossil fuels and downstream largely when the carbon embodied in LyondellBasell's products is released.[viii] In 2021 the company consumed more than 46.8 million tons of fossil feedstock.[ix]

It is clear that LyondellBasell and the sector, which is responsible for over 6 per cent of global emissions[x], must transform rapidly: not only for the planet, but for its business to remain viable in a net zero world.

The risks to the company are clear, and they will only grow with time

LyondellBasell's dependence on fossil fuels exposes the company to regulation and scrutiny which will only increase. Carbon pricing is already judged by the company to be a "substantial" risk in the next 5-20 years.[xi] As the cost of carbon rises and green technologies grow, companies that do not adapt face a high risk of stranded assets.

Delay or moving slowly will carry a cost. Petrochemicals is a competitive market with several large companies competing to sell homogenous end products. New technologies and assets take years to develop and bring online, so companies that move quickly have the early-mover advantage.

As chemicals will remain a critical sector beyond 2050, the opportunity for companies is strong

The world needs chemicals; 95 per cent of manufactured goods rely on some form of chemical process.[xii] Demand for key products may change, and the transition to a circular economy will mean there is less need for plastic products, but companies like LyondellBasell will continue to be important. By aligning with 1.5°C companies can hold a space in the market for emissions neutral chemicals.

LyondellBasell recognizes that climate change is an "urgent" issue for the planet and the company

LyondellBasell says "a commitment to net zero by 2050 and a credible pathway to 2030 [is] critical to [its] long-term operation."[xiii] It has published details of its strategy to address climate change, which it says "aligns with a 1.5°C world".[xiv] This report will assess that claim.

What are the findings of our assessment of LyondellBasell?

Despite the company's commitments, LyondellBasell does not yet align with any of the standards in ShareAction's 1.5°C benchmark for the chemical sector. Its targets are insufficient, and it has not yet committed to make the fundamental changes required to transition to emissions-neutral chemical production.

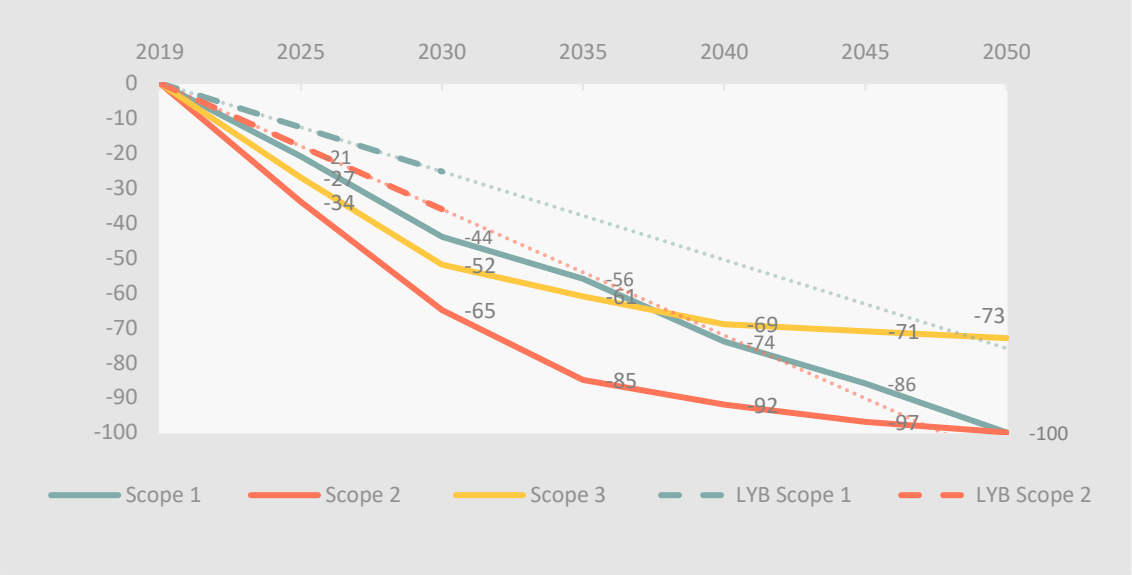
The investment decisions LyondellBasell makes now will determine its path to 2050. Inaction, delay, and prolonging dependence on fossil fuels is not a viable path for the planet, the company or its investors. Urgent changes are required to align the company with 1.5°C.

LyondellBasell must re-assess its targets

Targets determine the pace of a company's transition and capital allocation. Our assessment found that the targets LyondellBasell has set are not ambitious enough to align with 1.5°C. Under the company's current targets, by 2030 its scope 1 and 2 emissions will be more than 5

million MtCO2e higher than they would be under a chemical sector pathway with a two-thirds chance of limiting warming to 1.5°C with no or limited overshoot.[2]

Figure 1: LyondellBasell's emissions targets vs a 1.5°C low/no overshoot pathway for the chemical sector



Source: ShareAction analysis, UTS (2022) *OECM pathway for the global chemical sector*; CDP (2020), *Climate Change – LyondellBasell*.

LyondellBasell must urgently set a 1.5°C aligned scope 3 target. Without one, 80 per cent of its emissions are not covered by a target

LyondellBasell's scope 3 emissions would need to drop by almost three quarters by 2050 under a 1.5°C low/no overshoot pathway. The company estimates that four in every five tons of its

[2] See Appendix.

emissions are at scope 3.[xv] Without acting quickly to target these emissions, the company cannot address the material risks tied to its dependence on fossil fuels.

Figure 2: Emissions not covered by LyondellBasell's net zero targets

Source: ShareAction analysis, CDP (2022), *Climate Change – LyondellBasell*.

The company must commit to truly emissions-neutral chemical production by 2050

To eliminate emissions from its direct operations and feedstocks LyondellBasell must transition to emissions-neutral chemical production processes and feedstocks. Previous research by ShareAction has shown that these technologies are feasible and increasingly economically viable:

- Chemical production processes can be electrified and powered by electricity from renewable energy sources; and

- Fossil fuel feedstocks can be replaced with alternative feedstocks as sources of hydrogen and carbon, which are emissions neutral on a lifecycle basis, such as renewable hydrogen.

However, LyondellBasell has not committed to phase in these technologies

Chemical companies have less than three decades to transform their operating models; companies must use this time wisely. LyondellBasell's emissions reduction plans for the rest of this decade focus on investing in energy and fuel efficiency for its existing assets – assets that ultimately need to be phased out. While emissions from existing assets can be reduced, they cannot be eliminated completely. More fundamental changes are needed to deliver the deep emissions reductions that can align LyondellBasell with 1.5°C.

This is especially true of feedstocks. Without a plan to substitute fossil fuels for emissions neutral feedstocks, the company will not be able to tackle the majority of its scope 3 emissions.

By committing to transition to emissions neutral chemical production, LyondellBasell can show investors that it understands the need to move quickly and create a business model that is ready for 2050.

LyondellBasell must bring other elements of its climate strategy in line with a 1.5°C temperature goal

First, the company must commit to align 100 per cent of its future capital spending with 1.5°C low/no overshoot pathways. This is critical: capital spending is one of the clearest indicators to investors that a company is making meaningful process on its transition.

Second, the company must adopt an internal carbon price that covers all scopes. By excluding emissions embodied in its products from pricing the company has not internalized the cost of scope 3 – the majority of its emissions – which significantly reduces the incentive for low-carbon investment. Its current internal carbon price is simply too low and too narrow.

Third, the company should set a revenue target for sales from emissions-neutral chemicals.

LyondellBasell must reassess its policies on lobbying and supplier engagement

LyondellBasell has adopted policy positions to address climate change and requires suppliers and customers to try to reduce their emissions. However, in neither case are LyondellBasell's expectations explicitly aligned with a 1.5°C temperature goal. This can be quickly addressed and would be a positive signal of the company's intentions.

LyondellBasell must reassess its climate governance arrangements

It is critical that LyondellBasell is stewarded by a climate-competent board. It is welcome that the company says climate competence is considered when nominating board members but, with the exception of the newly appointed CEO, the current board does not appear to reflect strong experience of industrial decarbonisation or sustainability. The company must say how it will address this. The company must also review its executive compensation policies to meaningfully link pay to climate performance. At the moment this link is weak and does not create a strong financial incentive for climate action.

LyondellBasell must improve its disclosure of climate-related risks

It is welcome that the company discloses against both the recommendations of the Task Force for Climate-Related financial disclosures and completes the Carbon Disclosure Project questionnaire. The company has disclosed against the latter for a long time.

However, this assessment found that its disclosures were inconsistent and sometimes lacking in appropriate detail, particularly in the disclosure of climate-related risks and its use of scenario analyses that test the resilience of its climate strategy. While the company says its transition plan is "aligned with a 1.5°C world", the company says the scenarios it tests this strategy against are not 1.5°C scenarios.[xvi] This is clearly inconsistent. Without full disclosures of risks, scenarios and the assumptions behind them, investors cannot be sure of the company's resilience to climate change.

Recommendations to investors

LyondellBasell must make immediate and critical decisions

LyondellBasell is at a crossroads. This assessment has found that the company is not yet aligned with 1.5°C. Its business model – like the entire sector – is currently highly dependent on fossil fuels. The risks this carries for investors are clear and will only grow. Again: inaction, delay, and prolonging dependence on fossil fuels is not a viable path for the planet, the company or its investors.

The company can build on its progress with a new level of ambition

LyondellBasell has recently appointed Peter Vanacker as CEO, who was President and CEO of Neste from 2018 until his appointment. In 2018, commenting on the publication of the Intergovernmental Panel on Climate Change's report on 1.5°C, Mr Vanacker said:

> **"The world's leading scientists provided us a target to reduce climate change. We must bravely embrace it and continue developing new solutions for reaching it together… Right now, every fraction of a degree of warming counts. The outlook surrounding this challenge, however, should be one of hope, not fear."**[xvii]
>
> **- Peter Vanacker, CEO, *LyondellBasell***

The company has the means, the motive and the opportunity to act: it can decouple its business from fossil fuels and set itself on a 1.5°C aligned path to net zero, holding its position in the net zero chemicals sector. Now, investors should engage with the company and its new CEO to ask that it urgently responds to the findings of this assessment.

Based on the findings of ShareAction's assessment, investors should ask LyondellBasell the following questions:

Emissions targets

1) Will LyondellBasell immediately set emissions targets on all scopes that are aligned with 1.5°C low/no overshoot pathways?

Investments in emissions-neutral production processes

2) Will LyondellBasell commit to transition to emissions-neutral production processes and feedstocks on a schedule that will allow the company to align with 1.5°C low/no overshoot pathways?
3) Will the company further publish a schedule for the decommissioning and/or retrofitting of existing assets, and the phase in of emissions-neutral assets?

Investments in 'avoid or explain' technologies

4) Will the company publish evidence of the full cradle-to-grave emissions from *CirculenRenew* bio-based plastics, and show whether these will align with 1.5°C low/no overshoot pathways for the company over the lifespan of the product line?
5) Will the company commit not to pursue steam cracker electrification or carbon capture retrofits for its assets in the future; or will it publish credible evidence of the projected emissions of these technologies over their lifespans, and how these would be compatible with 1.5°C low/no overshoot pathways?

Capital spending alignment

6) Will the company commit to align 100 per cent of its capital spending with 1.5°C low/no overshoot pathways to 2050?

Carbon pricing

7) Will the company adopt a carbon price covering all scopes?

Reducing scope 3 emissions in LyondellBasell's value chain

(Relates to scope 3 emissions that are not feedstock-related. See above for question on emissions-neutral feedstocks.)

8) Will the company require its suppliers and customers to explicitly commit to align with with 1.5°C low/no overshoot pathways, and report on its engagements?

Green revenue targets

9) Will LyondellBasell set a target for revenue from the sale of emissions-neutral chemicals (which are compliant with the conditions in ShareAction's benchmark) to represent a proportion of overall sales in a given future year?

Enabling the circular economy

10) Will the company disclose all intentionally added chemical ingredients in its products and the volumes produced; and produce a strategy for eliminating or substituting, as far as is possible, hazardous substances from its chemical products?
11) Will the company exit its pyrolysis venture by 2050, on a schedule that is consistent with 1.5°C low/no overshoot pathways?

Responsible lobbying

12) Will the company commit to align its lobbying positions, and its trade association activities, with the goal of limiting global warming to 1.5°C without overshoot?

Climate governance

13) Will the company link executive renumeration to delivery against a 1.5°C aligned emissions reduction target in future pay awards?
14) Will the company explain how it will ensure the board's composition reflects experience of sustainability, decarbonisation, and climate risk management?

Disclosures and assessment of climate related risks?

15) Will the company disclose in full its assessments of climate related risks for specific sections of its business and in different geographies as appropriate, as per the conditions in ShareAction's Standard?
16) Will the company use a 1.5°C low/no overshoot scenario to test the resilience of its strategy, and disclose all of the inputs of the scenario in detail?
17) Will the company disclose capital spending on new and existing assets broken down by the type of asset, and by plant/facility, across all geographies?

Part 2: Full assessment of LyondellBasell

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1. Emissions targets

What is the standard for 1.5°C alignment?

The Standard:

The company must explicitly commit to align with 1.5°C low/no overshoot pathways. Further, it must commit to mid and long-term emissions targets that are aligned with such pathways.

Metrics for assessment:

The company's emissions targets align with these trajectories, as per the University of Technology Sydney's 1.5°C low/no overshoot pathway for the global chemical sector:

	Reduction on 2019 level		
	Scope 1	Scope 2	Scope 3
2025	-21	-34	-27
2030	-44	-65	-52
2035	-56	-85	-61
2040	-74	-92	-69
2045	-86	-97	-71
2050	-100	-100	-73

These emissions reductions targets are consistent with a high-probability of keeping global warming to 1.5°C degrees without overshoot, based on a sector-specific pathway developed by the University of Technology Sydney.[xviii] The graph below shows how LyondellBasell's emissions *would* decrease if they company *were* aligned with the benchmark.

Figure 3: Projection of LyondellBasell's emissions under a 1.5°C no-overshoot pathway (see footnote)

Source: ShareAction analysis of CDP (2020, 2022), *Climate Change - LyondellBasell*; UTS (2022), *OECM 1.5-degree pathway for the global chemicals sector*. **N.b the scope 3 figure used is from 2021 reporting year, not 2019. This is due to more comprehensive data being available.**

Is LyondellBasell aligned with the benchmark?

LyondellBasell's emissions reduction targets are not aligned with the benchmark.

LyondellBasell has set 2030 and 2050 targets for scopes 1 and 2

LyondellBasell says that it has "a transition plan which aligns with a 1.5°C world".[xix] It is involved in the Science-Based Targets Initiative's efforts to develop a 1.5°C pathway for the sector.[xx]

The company aims to achieve a 30 per cent absolute reduction in scope 1 and 2 emissions by 2030, on a 2020 baseline.[xxi] The company has not set a scope 3 target.

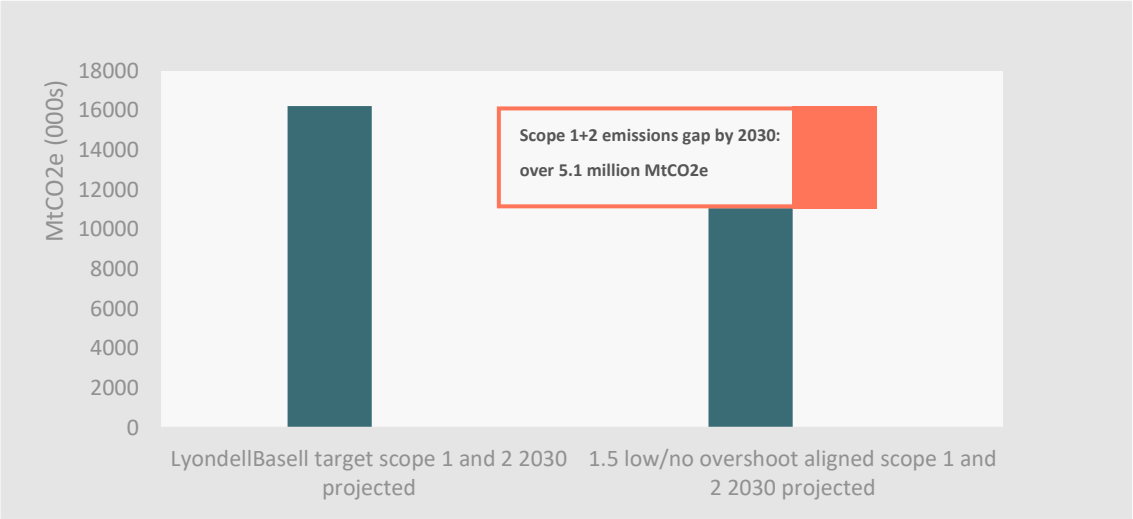
By 2030, LyondellBasell's scope 1 and 2 emissions will be more than 5 million tons higher than under a 1.5°C low/no overshoot pathway

LyondellBasell's 2030 targets would reduce scope 1 and 2 emissions by 25 and 36 per on 2019 levels, respectively.[3] Under a 1.5°C low/no overshoot pathway emissions would reduce by 44 and 65 per cent respectively.

On the trajectory of its targets LyondellBasell's scope 1 and 2 emissions in 2030 would be more than 5.1 million tons (CO2e) higher than under a 1.5°C low/no overshoot pathway.[4] The company would not cut its scope 1 and 2 emissions enough to satisfy 1.5°C low/no overshoot-aligned 2030 targets until the late 2030s, 7-8 years behind schedule.

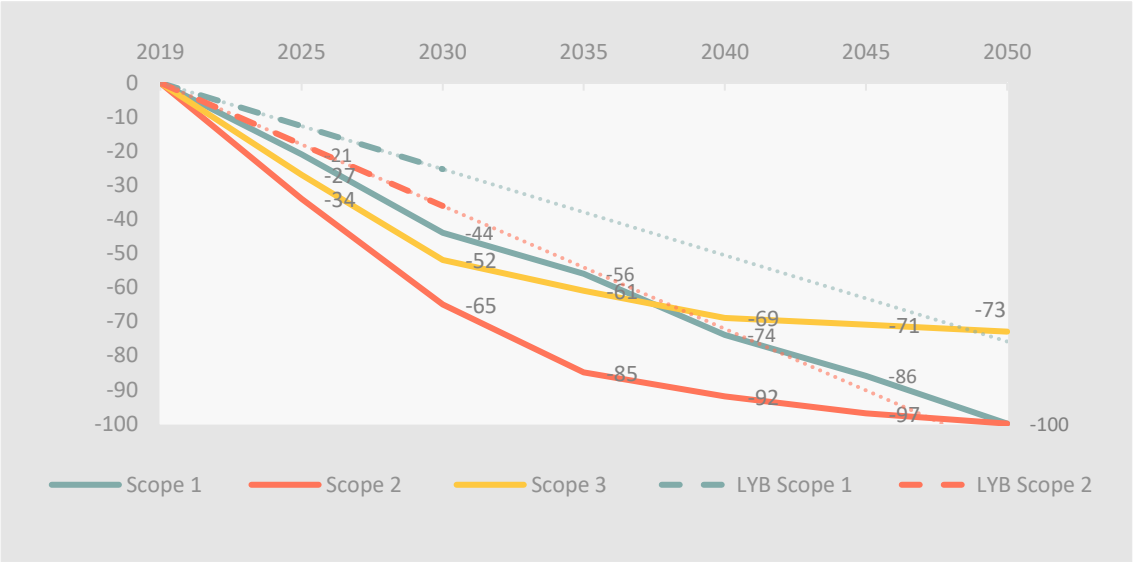
[3] For workings please see Appendix 1.
[4] Ibid.

Figure 4: LyondellBasell's 2030 emissions gap



Source: ShareAction analysis of CDP (2020), *Climate Change - Lyondell Basell*; UTS (2022) OECM 1.5-degree pathway for the global chemicals sector.[xxii]

Figure 5: LyondellBasell's emissions targets compared to the benchmark's emission targets



Source: ShareAction analysis of CDP (2020), *Climate Change - Lyondell Basell*; UTS (2022) OECM 1.5-degree pathway for the global chemicals sector.[xxiii]

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Without a scope 3 target, 80 per cent of the company's emissions are not addressed

It is a critical omission that the company has not set a scope 3 target. Four in every five tons of LyondellBasell's emissions are at scope 3.[5] Almost all of these scope 3 emissions – and 70 per cent[6] of the company's total emissions – are from the purchase of goods and services, and from the use and disposal of end products; in other words, upstream largely from the purchase of fossil fuels and downstream largely when the fossil carbon LyondellBasell embodies in its products is released.[xxiv]

Figure 6: Emissions not covered by LyondellBasell's net zero targets

Source: ShareAction analysis, CDP (2022), *Climate Change – LyondellBasell*.

[5] See technical appendix for workings.
[6] Ibid.

To address scope 3, the company must change its feedstocks

LyondellBasell will not be able to reduce these emissions substantially without substituting fossil fuels for emissions-neutral feedstocks, – or reducing chemicals production. A scope 3 target will drive LyondellBasell to make progress on this transition.

The circular economy is critical to reducing waste and plastic pollution, and reducing emissions. However, no company can rely entirely on circularity to reduce scope 3 emissions, by keeping all of the carbon embodied in its plastic products from being released, because:

- LyondellBasell has only limited control over what happens to its plastics once they are sold;
- Even with a very large increase in reuse and recycling, plastic leakage will still occur;[xxv]
- No recycling system is completely efficient, so process losses will occur; and
- Even if the company's downstream emissions were eliminated entirely, the upstream emissions from the purchase of fossil fuels as feedstocks would remain. These are around 40 per cent of the company's scope 3 emissions.[7] The company has calculated that 94 per cent of its emissions from purchased goods and services are from the purchase of feedstocks.[xxvi]

To reduce these emissions LyondellBasell should first set a target, and then begin to gradually phase in alternative feedstocks and emissions-neutral production processes.

[7] Ibid.

Recommendations to LyondellBasell and investors

LyondellBasell must urgently reassess its targets to align with a 1.5°C low/no overshoot pathway

A company's targets determine the pace of its decarbonisation and capital allocation, so these must be reassessed. Targets that are too low not only permit high emissions, they can also increase climate-related financial risks. As the company has itself admitted:

> **"Should LyondellBasell be considered as insufficient in addressing climate challenges to the expectations of our stakeholders and customers, this could result in adverse financial effects, for example through loss of market share from customer deselection, departure of employees, or loss of shareholder support."**[xxvii]
>
> ***- LyondellBasell***

LyondellBasell must:

- Immediately set emissions targets on all scopes that are aligned with 1.5°C low/no overshoot pathways.

Investors should ask LyondellBasell:

- Will LyondellBasell immediately set emissions targets on all scopes that are aligned with 1.5°C low/no overshoot pathways?

2. Investments in emissions-neutral chemical production

What is the standard for 1.5°C alignment?

The Standard:
The company has committed to transition to emissions neutral feedstocks and production processes for primary chemicals specified in this standard. The company will phase in emissions-neutral chemical production on a schedule that will achieve 1.5°C aligned emissions reductions, as per the metrics below.
Metrics for assessment:
See sections 2.1 – 2.3 in the full benchmark.

Please refer to the full benchmark for the detailed standards for producing or sourcing emissions-neutral hydrogen and carbon, and producing emissions-neutral primary chemicals.

Is LyondellBasell aligned with the benchmark?

LyondellBasell's plans to reduce its emissions are not aligned with the benchmark.

LyondellBasell says it will improve energy and fuel efficiency to achieve its 2030 emissions goals

Section 1 of this report showed that LyondellBasell's targets do not align with a 1.5°C low/no overshoot pathway, so measures announced to achieve these targets are also insufficient. To achieve these targets the company plans to improve energy efficiency from its existing assets and purchase more renewable energy. It is welcome that the company plans to source more renewable energy, but the scope 2 target they have set is still not ambitious enough.

To reduce emissions to 2030, the company will:

- Use energy and fossil fuels more efficiently at its sites. For example, the company aims to minimise flaring at its sites, which means burning off excess natural gas;[xxviii]
- Use less carbon-intensive fuels. For example, the company is replacing coal with steam as the source of energy at the on-site power plant at its Wesseling facility in Germany;[xxix]
- Source 50 per cent of its current level of electricity consumption from renewable sources by 2030; and[xxx]
- The company will exit its refining business.[xxxi]

The company says that taken together these measures will achieve one third of the company's emission reduction goals by 2025, and that remaining reductions will be achieved when existing sites come up for maintenance before 2030.[xxxii]

These are not long-term solutions; the company has not committed to transition to emissions-neutral processes and feedstocks

Making changes to conventional processes can reduce emissions to an extent, but it cannot eliminate them completely, as required on scopes 1 and 2 by 2050.[xxxiii] As the benchmark specifies and our previous investor briefing explains in detail, new emissions-neutral processes are required to achieve this.

Further, these measures will not tackle the majority of the company's emissions at scope 3; specifically, from its use of fossil fuels as feedstocks. Emissions from the purchase of goods and services, and from the use and disposal of sold products,[xxxiv] are the majority of the company's scope 3 emissions, and 70 per cent[8] of its overall emissions. Without new emissions-neutral feedstocks, LyondellBasell will struggle to address this scope 3 footprint.

Without transitioning to emissions-neutral feedstocks, LyondellBasell will struggle to significantly reduce its scope 3 footprint.

To reiterate: the circular economy is critical to reducing waste and plastic pollution, and reducing emissions. However, no company can rely entirely on circularity to reduce scope 3 emissions, by keeping all of the carbon embodied in its plastic products from being released, because:

- LyondellBasell has only limited control over what happens to its plastics once they are sold;
- Even with a very large increase in reuse and recycling, plastic leakage will still occur;[xxxv]
- No recycling system is completely efficient, so process losses will occur; and

[8] See technical appendix for workings.

- Even if the company's downstream emissions were eliminated entirely, the upstream emissions from the purchase of fossil fuels as feedstocks would remain. These are around 40 per cent of the company's scope 3 emissions.[9] The company has calculated that 94 per cent of its emissions from purchased goods and services are from the purchase of feedstocks.[xxxvi]

Beyond 2030, LyondellBasell's decarbonisation plans are unclear

The company is part of a consortium to pilot a hydrogen and ammonia production facility with renewable hydrogen and blue hydrogen.[xxxvii] A pilot project that would use renewable hydrogen for ammonia production is a welcome step. However, details of this pilot – including how much it would rely on renewable hydrogen, and the ammonia production process itself – are unclear.

LyondellBasell says that "new technologies across the company's manufacturing footprint [will be needed to reach net zero], and [it is] assessing technologies such as cracker electrification, use of hydrogen, carbon capture and storage (CCS) and carbon utilization.[xxxviii] Because these technologies are unlikely to achieve the deep emissions reductions required for the 2040s and 2050s, they are unlikely to be able to align with 1.5°C degree pathways (these technologies are discussed in more detail in Section 3).

Recommendations to LyondellBasell and investors

The company must commit to transition to emissions-neutral processes and feedstocks

[9] Ibid.

A strategy of trying to mitigate emissions from fossil fuels rather than phasing them out would create several risks. It would lock in a high level of emissions, making the company increasingly exposed to regulation, and delay investment in 2050-ready technologies.

Setting a scope 3 target is especially important, as the company must reduce its feedstock emissions. With less than three decades to make transition, companies must use their time wisely. The company must make a firm, long-term commitment to transition to emissions-neutral chemical production processes and feedstocks.

LyondellBasell must:

- Commit to transition to emissions-neutral production processes and feedstocks on a schedule that will align the company with 1.5°C low/no overshoot pathways; and
- Publish a schedule for the decommissioning and/or retrofitting of existing assets, and the phase in of emissions-neutral assets.

Investors should ask LyondellBasell:

- Will the company commit to transition to emissions-neutral production processes and feedstocks on a schedule that will align the company with 1.5°C low/no overshoot pathways?
- Will the company publish a schedule for the decommissioning and/or retrofitting of existing assets, and the phase in of emissions-neutral assets?

3. Investments that companies must avoid or explain

What is the standard for 1.5°C alignment?

The Standard:
The company must either: **avoid** investing in the following technologies or materials; or it must **explain** why it has invested in them and produce credible evidence that its activity is aligned with 1.5°C low/no overshoot pathways. ***'Avoid or explain' technologies and materials (see Appendix of the benchmark for details):*** • Carbon capture and 'blue' hydrogen; • Steam cracker electrification; • Methane pyrolysis; and • Biomass for feedstocks. New investments in unabated fossil fuel-based assets cannot be aligned under any circumstances.
Metrics for assessment:
Either • The company does not invest/has not stated an intention to invest in any 'avoid-or-explain' technologies or materials. *Or* • The company is invested in/has stated its intention to invest in 'avoid-or-explain' technologies or materials; it has produced evidence* that this activity will be aligned with 1.5°C low/no overshoot pathways on all scopes for its full lifespan. *Evidence could include a full cradle-to-grave lifecycle assessment that does not count avoided emissions, or a schedule of retrofitting or decommissioning that is consistent with 1.5°C low/no overshoot pathways.

Is LyondellBasell aligned with the benchmark?

LyondellBasell's avoid-or-explain investments are not aligned with the benchmark.

LyondellBasell is considering investments in 'avoid-or-explain' technologies

LyondellBasell has said that it is "assessing technologies such as cracker electrification [and] use of hydrogen, carbon capture and storage (CCS)" for use beyond 2030.[xxxix] Both these technologies will not be able to achieve full emissions neutrality and would depend on continued use of fossil feedstocks, as is explained in more detail in the Appendix of the full benchmark.

Because companies need to have achieved very deep cuts to their emissions by 2040, it is unlikely that these technologies could align with 1.5°C degree pathways. This means that these technologies will likely be unsuitable by 2040, if not sooner. If they were pursued, the company would have to provide comprehensive disclosures of the emissions they would produce over their lifespan to show that emissions would be within acceptable limits on all scopes.

LyondellBasell has investments that are unlikely to be 1.5°C aligned

In 2019 the company announced that it would make plastics from "renewable feedstocks such as used cooking oil" as part of its *Circulen* product portfolio.[xl] Bio-based materials are turned into a feedstock that can be added to fossil feedstock and allocated to the final product on a mass balance basis. The company says that is has conducted an "ISO compliant and peer-reviewed Life Cycle Assessment" which showed that "[c]irculenRenew [polypropylene] has a cradle-to-gate carbon footprint of -1.99 tons of CO2 equivalent (CO2 e) per ton of [polypropylene], at least

210% difference when compared with the cradle-to-gate carbon footprint of its fossil-based equivalent of 1.77 tons of CO2 e per ton of [polypropylene]."[xli]

This Life Cycle Assessment has not been published. It is unclear what the emissions of *CirculenRenew* would be over its full lifecycle (cradle-to-grave) including also its end-of-life emissions. As the Appendix of the benchmark explains, bio-based materials are not necessarily carbon neutral.

Recommendations to LyondellBasell and to investors

LyondellBasell must:

- Publish evidence of the full cradle-to-grave emissions from *CirculenRenew* bio-based plastics, and how these will align with 1.5°C low/no overshoot pathways over the lifespan of the product line; and
- Commit not to pursue steam cracker electrification or carbon capture retrofits for its assets in the future; or, publish credible evidence of how these technologies would be compatible with 1.5°C low/no overshoot pathways.

Investors should ask LyondellBasell:

- Will the company publish evidence of the full cradle-to-grave emissions from *CirculenRenew* bio-based plastics, and show whether these will align with 1.5°C low/no overshoot pathways for the company over the lifespan of the product line?
- Will the company commit not to pursue steam cracker electrification or carbon capture retrofits for its assets in the future; or will it publish credible evidence of the projected emissions of these technologies over their lifespans, and how these would be compatible with 1.5°C low/no overshoot pathways?

4. Capital Spending Alignment

What is the standard for 1.5°C alignment?

The Standard:
100 per cent of the company's capital spending on new and existing assets is aligned with 1.5°C low/no overshoot pathways, as per the criteria below.
Metrics for assessment:
See Figure 3 in the full benchmark.

Detailed metrics for determining whether capital spending is 1.5°C aligned are provided in Figure 3 of the full benchmark.

100 per cent of companies' capital investments must be 1.5°C aligned

Capital spending is one of the clearest indicators of whether a company is truly 1.5°C low/no overshoot aligned. Where capital spending is to pay for an asset that will not be emissions neutral from its inception (on at least scopes 1 and 3 – scope 2 decarbonisation can follow after an asset has come online), a company must produce evidence that emissions from that asset will be aligned with 1.5°C low/no overshoot pathways for its lifespan.

Figure 7 summarizes the criteria for 1.5°C low/no overshoot aligned capital investment. (A more detailed table in the full benchmark gives examples of how different assets would fall into these categories.)

Figure 7: simplified summary of benchmark metrics for 1.5°C aligned capital spending

1.5°C Aligned?	CAPEX category:	Description:	Engagement required:
ALIGNED	Emissions-neutral assets	New assets, energy and feedstock procurements, that are emissions-neutral	None
	Maintaining existing assets (Aligned)	To prolong the life of existing assets; company has produced evidence that this is consistent with an asset decommissioning/retrofitting schedule that will achieve 1.5°C aligned emissions reductions	
	Investments in 'concerning technologies and materials' (see Section 3) (Aligned)	New assets that will not achieve full decarbonisation; company has produced evidence that emissions across all scopes will be consistent with 1.5°C aligned emissions reductions for the lifetime of the asset	
NOT ALIGNED	Unabated fossil assets	New assets for conventional, fossil fuel-based chemical production processes	Why is the company's CAPEX not aligned? What climate-related risks does this create?
	Maintaining existing assets (Not aligned)	To prolong the life of existing assets; inconsistent with asset decommissioning/retrofitting schedule that will achieve 1.5°C aligned emissions reductions, or company has not demonstrated that consistent	
	Investments in 'concerning technologies and materials' (see Section 3) (Not aligned)	New assets that will not achieve full decarbonisation; emissions across all scopes will be inconsistent with 1.5°C aligned emissions reductions for the lifetime of the asset/procurement, or company has not demonstrated that consistent	

Is LyondellBasell aligned with the benchmark?

LyondellBasell's capital spending disclosures are insufficient to make an assessment, so the company is not aligned with the benchmark.

LyondellBasell's disclosures are not detailed enough to make an assessment

The company has not committed to align its capital spending with 1.5°C low/no overshoot pathways, and it has not disclosed a detailed breakdown of its capital spending. Without this information it is not possible to verify whether a company is investing in aligned assets.

LyondellBasell says that it "expect[s] capital spending in the future will include investments to support lowering emissions in [its] operations…[it does] not expect the capital spending to support [its] ambitions over the next two years will represent a significant amount of [its] total capital expenditures."[xlii] The company said the same thing in its previous annual disclosure.[xliii]

Recommendations to LyondellBasell and investors

LyondellBasell must:

- Commit to align 100 per cent of its capital spending with 1.5°C low/no overshoot pathways.

Investors should ask LyondellBasell:

- Will the company commit to align 100 per cent of its capital spending with 1.5°C low/no overshoot pathways?

5. Carbon pricing

What is the standard for 1.5°C alignment?

The Standard:
The company has set a company-wide internal carbon price covering all geographies and scopes, to drive low-carbon investment in line with 1.5°C low/no overshoot pathways.
Metrics for assessment:
• The company has set and disclosed an internal carbon price which covers all geographies and scopes. • The internal carbon price strongly influences decision making; the company discloses the process by which its internal carbon price is factored into decision making.

Is LyondellBasell aligned with the benchmark?

LyondellBasell's internal carbon price is not aligned with the benchmark.

LyondellBasell's carbon price is simply too low

In 2021 LyondellBasell uses a shadow price of 25 euros/ton to evaluate European capital investments, covering scope 1 emissions only.[xliv] Its approach to carbon pricing is "differentiated" (the price will vary by geography) and "evolutionary" (the price will be higher in the future – the carbon cost of long-life capital investments may be calculated using several, progressively higher carbon prices) "driven by [a] specific assessment, e.g., geography,

applicable legislation, and timeframe of an investment."[xlv] In 2021 the company said it intended to "expand its use for evaluation of future key global capital project investment decisions…[and] assessment of potential investments in low-carbon technologies."[xlvi]

Carbon has to be priced at a level that makes it attractive for companies to decarbonise fast enough to align with 1.5°C. At only 25 EUR/ton, and covering only one scope, LyondellBasell's price is simply too low.

As a reference point; a review by the European Investment Bank of 20 1.5°C low/no overshoot scenarios run through integrated assessment models[10], which screened out bioenergy with carbon capture and storage (BECCS) for negative emissions, found that a shadow price of EUR2022 197 would be needed in 2025 to drive 1.5°C low/no overshoot-aligned investment.[xlvii] The findings of this review are consistent with the IPCC's median estimates of carbon pricing aligned with a 1.5°C temperature goal.[xlviii]

Less than one in seven tons of LyondellBasell's emissions are priced[11]

The company believes carbon pricing should "not apply to carbon embedded in manufactured products."[xlix] With this exclusion, the company is not internalizing the cost of the majority of its emissions. By not pricing scope 3 emissions, the cost incentive to invest in low-carbon assets and feedstocks is reduced significantly. This is inconsistent with a 1.5°C aligned transition.

In addition, LyondellBasell should describe in greater detail how it weighs shadow carbon pricing in decision making to drive low-carbon investment.

[10] Sophisticated models of climate systems and other conditions that affect our ability to respond to climate change. For more details please see: Carbon Brief (2020), *Q&A: How 'integrated assessment models' are used to study climate change.*

[11] Scope 1 emissions are 14 per cent of LyondellBasell's 2021 emissions. See Appendix.

Recommendations to LyondellBasell and investors

LyondellBasell must:

- Adopt a carbon price covering all scopes.

Investors should ask LyondellBasell:

- Will the company adopt a carbon price covering all scopes?

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6. Reducing scope 3 emissions

What is the standard for 1.5°C alignment?

The Standard:
The company is acting to reduce scope 3 emissions beyond its direct control. It is engaged with its value chain to align with 1.5°C low/no overshoot pathways. (This section relates to scope 3 emissions that are not related to fossil fuels purchased by the company for energy and as feedstocks.)
Metrics for assessment:
• The company expects its suppliers and customers to explicitly commit to align with 1.5°C low/no overshoot pathways; • The company engages with its suppliers and customers, and reports on who it has engaged with and the outcomes of engagement.

This section of the benchmark relates to scope 3 emissions beyond those related to the purchase and use of fossil fuels as feedstocks. For example, from transport. Practices to reduce feedstock-related emissions are covered in Section 2 of the benchmark.

Is LyondellBasell aligned with the benchmark?

LyondellBasell's policies to reduce emissions in its value chain are not aligned with the benchmark.

LyondellBasell engages with suppliers, but it does not require them to be 1.5°C aligned

The company has published a supplier code of conduct, which says suppliers are expected to "[u]se resources efficiently, seek to reduce water use and greenhouse gas emissions, and encourage the use of energy-efficient technologies in their production and services".[I]

LyondellBasell says it engages with suppliers to monitor compliance with its code, and it also launched a programme to improve the climate practices of its suppliers in 2021. The company has said that it has a "retain and engage" policy for non-compliance.[Ii] The company plans to broaden engagement with key suppliers over the next three years.

It is welcome that LyondellBasell expects its suppliers to reduce their climate impacts and that the company is engaging with suppliers. However, the code does not specify that suppliers and customers must commit to align with 1.5°C, only saying it expects suppliers to "reduce" emissions. This permits suppliers with weak climate commitments in the company's supply chain.

Recommendations to LyondellBasell and to investors

LyondellBasell must:

- Amend its Code of Conduct to require suppliers and customers to explicitly commit to align with 1.5°C low/no overshoot pathways; and
- Report at least annually on its engagements with its suppliers and direct customers, including the number of engagements, with whom, and the follow-up actions agreed and taken by both parties.

Investors should ask LyondellBasell:

- Will the company require its suppliers and customers to explicitly commit to align with with 1.5°C low/no overshoot pathways, and report on its engagements?

7. Green revenue targets

What is the standard for 1.5°C alignment?

The Standard:
The company has set a target for revenue from the sale of emissions-neutral chemicals, which are compliant with the production processes listed in Section 2 of this benchmark, to represent a proportion of overall sales in a future year.
Metrics for assessment:
• The company has set a green revenue target. The target is for a specified proportion of revenue to be from the sale of emissions-neutral chemicals in a future year.*

Is LyondellBasell aligned with the benchmark?

LyondellBasell has not set a future revenue target for the sale of emissions-neutral chemicals, so the company is not aligned with the benchmark.

LyondellBasell should set a green revenue target

By linking climate targets to financial returns, green revenue targets can be a powerful incentive for companies to reduce their emissions.

Green revenue should only be that from the sale of chemicals made with emissions-neutral feedstocks, in an electrified process that is powered by 100 per cent renewable energy. Chemicals made in plants that are not yet completely emissions-neutral should not be counted

as green, and neither should revenue from chemicals where emissions-neutral content has been allocated with a mass balance approach.

Recommendations to LyondellBasell and investors

LyondellBasell must:

- Set a target for revenue from the sale of emissions-neutral chemicals (which are compliant with the conditions in ShareAction's benchmark) to represent a proportion of overall sales in a future year.

Investors should ask LyondellBasell:

- Will LyondellBasell set a target for revenue from the sale of emissions-neutral chemicals (which are compliant with the conditions in ShareAction's benchmark) to represent a proportion of overall sales in a future year?

8. Enabling the circular economy

What is the standard for 1.5°C alignment?

The Standard:
The company is committed to enabling the circular economy by (1) creating materials that are safe and easy to reuse and circulate; and (2) by developing appropriate recycling technologies.
Metrics for assessment:
See Sections 8.1-2 below.

8.1: Products that are safe and easy to circulate

The Standard:
The company is committed to eliminating hazardous substances in its chemical products, in order to promote reuse and recycling.
Metrics for assessment:

- The company discloses all of the intentionally added chemical ingredients in its products;
- The company discloses an assessment of the presence of hazardous chemicals in its products; and
- The company has a strategy for eliminating or substituting hazardous substances from its products.

8.2: Developing appropriate recycling methods (chemical recycling)

The Standard:

If the company is developing, or intends to develop waste-to-feedstock chemical recycling technologies:

The company's chemical recycling project meets the following criteria:

- It will align with 1.5°C low/no overshoot pathways;
- The feedstock it produces will be compatible with emissions-neutral chemical production processes as per Section 2 of this benchmark; and
- In accordance with the waste hierarchy, the company will only chemically recycling plastic waste that cannot be reused or recycled by other means.

Metrics for assessment:

- The company does not own or invest in pyrolysis assets, or it has committed to exit any investments in pyrolysis by 2050 at the latest;
- Any gasification assets owned or financed by the company will –
    - Heat the gasifier with electricity and have a plan to source 100 per cent renewable electricity by 2050 at the latest;
    - Use renewable hydrogen to upgrade the 'raw' syngas from the gasifier (which would eliminate CO2 emissions at this stage);
    - Not sell any syngas for fuel; and
- The company commits that any feedstocks it purchases will be from chemical recycling facilities that are compliant with these conditions by 2050 at the latest.

This standard is based on previous research by ShareAction on how chemical producers can align with the circular economy. Please read our previous investor briefing for more detail.

Is LyondellBasell aligned with the benchmark?

LyondellBasell's circular economy practices are not aligned with the benchmark.

LyondellBasell aims to make a proportion of its plastics from recycled materials

LyondellBasell says that 'transitioning to a circular economy will reduce resource use and enable a more sustainable future.' The company says that plastics "will continue to play a key role in our society", but that "the mismanagement of plastic waste…has reached a tipping point", so plastics need to be "circulated back into the economy after use". [lii]

LyondellBasell is focussed on recycling and material recovery. It is selling three different types of plastics made from recycled materials under the brand name *Circulen*[liii]:

- *CirculenRecover:* Mechanically recycled pre- and post-use plastic in a joint venture with SUEZ. In 2018 the company targeted 100,000 tons of recycled polymers by 2020.[liv] However, as of 2021, the production capacity was only 55,000 tons;[lv]
- *CirculenRevive:* polymers which are allocated, using a mass balance approach, a portion of feedstock made from plastic waste via a chemical recycling process called pyrolysis (this is explained in detail in our previous investor briefing); and
- *CirculenRenew:* polymers which are allocated, using a mass balance approach, a portion of feedstock made from biomass. *CirculenRenew* was discussed in depth in Section 3 of this report.

The company aims to produce two million tons of these polymers annually by 2030. It says that "approximately half" will be *Recover,* "approximately 25%" will be *Revive,* and the remainder will be *Renew.*[lvi] LyondellBasell's overall polymer production capacity is over 13 million tons per year.[lvii]

The company aims to produce two million tons of recycled polymers annually by 2030. Its polymer production capacity is over 13 million tons per year.

The company has not committed to address hazardous substances in its products

The presence of hazardous substances in chemical products can make them more difficult, and less safe, to reuse and recycle in the future. This is a barrier to the development of the circular economy.[lviii] It is chemical companies that control whether these substances enter circulation.

The company has not committed to disclose all intentionally added chemical ingredients in their products, and it has not published a strategy to eliminate substitute hazardous substances from its products.

LyondellBasell's chemical recycling venture is unlikely to align with 1.5°C pathways

LyondellBasell's chosen chemical recycling technology is pyrolysis. Pyrolysis involves heating plastic waste without oxygen to produce pyrolysis oil, a naphtha-like oil, that can be fed into a cracker.

There are several problems with pyrolysis:

- **It is a high emissions process that would be difficult, or impossible, to decarbonise:** Plastic waste is heated in a pyrolysis chamber, which is heated with the combustion of fossil fuels and the combustion of gas by-product from the process. If the heat source was electrified to eliminate these emissions, gas by-products would still need to be captured;

- **Pyrolysis produces a substance that has to be diluted with fossil fuels to produce a viable feedstock:** Plastic is turned into a naphtha-like oil, which is added to virgin naphtha and fed into a steam cracker. This makes high value chemicals which can be made into new plastics. Pyrolysis oil has to be diluted with fossil fuels to produce a viable feedstock, and it is unlikely a steam cracker could ever run of pyrolysis oil alone, which ties the process to virgin fossil fuel feedstocks; and

- **Pyrolysis oil doesn't integrate with future emissions-neutral production processes:** It integrates with steam cracking, which needs to be phased out as fossil fuel feedstocks

are phased out. Steam cracking needs to be replaced with emissions-neutral production processes by 2050 at the latest.

The only waste-to-feedstock chemical recycling technology that would be compatible with emissions-neutral production processes, and which could align with 1.5°C low/no overshoot pathways, is gasification of plastic waste performed under very strict conditions. Please read our previous investor briefing for more details.

LyondellBasell should reassess its chemical recycling project and act to address barriers to the circular economy

As one of the largest plastics producers in the world - the single largest producer of polyethylene and polypropylene in Europe, and the second largest in North America[lix] - LyondellBasell's behaviour as a company will have a major impact on efforts to transition to a circular economy. It must align itself with this goal.

The absence of a commitment for LyondellBasell to address hazardous substances is disappointing. Making products that are safe and easy to reuse, and eventually recycle, is one of the most impactful steps that LyondellBasell can take to increase circularity.

Further, the company's chemical recycling venture is inconsistent with 1.5°C pathways. The company's investment here represents an opportunity cost over a chemical recycling technology that could align with 1.5°C and be used beyond 2050.

Recommendations to LyondellBasell and to investors

LyondellBasell must:

- Disclose all intentionally added chemical ingredients in its products; and produce a strategy for eliminating or substituting, as far as is possible, hazardous substances from its chemical products; and
- Commit to exit its pyrolysis venture by 2050, on a schedule that is consistent with 1.5°C low/no overshoot pathways.

Investors should ask LyondellBasell:

- Will the company disclose all intentionally added chemical ingredients in its products and the volumes produced; and produce a strategy for eliminating or substituting, as far as is possible, hazardous substances from its chemical products?
- Will the company exit its pyrolysis venture by 2050, on a schedule that is consistent with 1.5°C low/no overshoot pathways?

9. Responsible lobbying

What is the standard for 1.5°C alignment?

The Standard:
The company's lobbying promotes and protects policies in line with the goal of limiting warming to 1.5°C without overshoot.
Metrics for assessment:

• The company explicitly commits to align all of its lobbying activity with the goal of limiting global warming to 1.5°C;
• The company expects its trade associations to explicitly commit to align all of their lobbying activity with the goal of limiting global warming to 1.5°C;
• The company audits its trade associations' lobbying positions at least annually and publishes evidence of its engagement with associations where their lobbying positions are not 1.5°C aligned;
• The company discloses all lobbying activities in all jurisdictions, including:
  ○ trade association membership;
  ○ political donations and money paid to lobbyists;
  ○ meetings with lobbyists and politicians with disclosure of what was discussed;
  ○ policy submissions; and
• The company has policies to prevent corruption and conflicts of interest.

Is LyondellBasell aligned with the benchmark?

LyondellBasell's lobbying policy is not aligned with the benchmark.

LyondellBasell is involved in lobbying on climate policy

LyondellBasell engages in lobbying and has published statements about its policy goals. It says it "advance[s its] public policy agenda through direct lobbying, involvement in various trade associations and the LyondellBasell Political Action Committee ("LYB PAC")."[lx] The company has published its policy aims in 'Principles for Public Policy'[lxi]:

"To Address Climate Change [the company says that it] support efforts to:

- Implement a global price on carbon to facilitate the transition to a net zero economy;
- promote renewable and clean energy development;
- deploy infrastructure to mitigate the impact of climate change;
- reward investment in carbon-reducing technologies; and
- expand research and development on carbon-reducing technologies"[lxii]

LyondellBasell discloses details of its engagement on policy proposals,[lxiii] publishes a report on its US political activity[lxiv] and has policies on conflicts of interest and corruption.[lxv] The company discloses its membership of trade associations, and reviews its membership of associations at least annually.[lxvi] It discloses an audit of its trade associations' climate positions, whether the company considers them to be Paris aligned, and whether the company has engaged with the associations on those positions.[lxvii]

LyondellBasell says that while "[it] may not completely agree with every position taken by an association or its members, corporate memberships enable us to voice our support, concerns, perspectives and positions on proposed legislation and regulations.[lxviii]

It is welcome that the company is transparent about its positions, its trade association membership and its policy engagement, and that it takes steps to evaluate the positions of associations that it lends its voice to.

However, the company has not committed to adopt lobbying positions that are explicitly 1.5°C aligned

However, LyondellBasell has not explicitly committed to align its lobbying activity with the goal of limiting global warming to 1.5°C, which would mean promoting and supporting policies with that level of ambition and arguing against less ambitious policy.

Recommendations to LyondellBasell and its investors

LyondellBasell must:

- Commit to explicitly align its lobbying positions, and its trade association activities, with the goal of limiting global warming to 1.5°C without overshoot.

Investors should ask LyondellBasell:

- Will the company commit to explicitly align its lobbying positions, and its trade association activities, with the goal of limiting global warming to 1.5°C without overshoot?

10. Climate governance

What is the standard for 1.5°C alignment?

The Standard:
The company has clearly designated responsibility for climate at c-suite level and links executive renumeration to 1.5°C aligned emissions targets. It appoints board members who are qualified to manage a 1.5°C aligned transition.
Metrics for assessment:
• Responsibility for climate and sustainability goals is clearly designated at c-suite level to the CEO and at least one other senior executive; • The company links the renumeration of the CEO and at least one other senior executive with climate responsibility directly to progress against 1.5°C aligned emission targets, either through salary, bonuses or long-term incentive plans; • Responsibility for oversight of climate-related issues is clearly designated at board level; • The company appoints board members who have worked in a sustainability-oriented company or field, or have held positions related to sustainability, climate strategy or decarbonisation in heavy industry; and • The climate competence of the board is assessed in the company's audit of the board, and the company discloses the results and metrics of this audit at least annually.

Is LyondellBasell aligned with the benchmark?

LyondellBasell is not aligned with the benchmark.

LyondellBasell clearly designates responsibility for climate strategy at c-suite level

Responsibility for sustainability and ESG sits with the CEO and a Chief Sustainability Officer, who chairs a Sustainability Steering Committee.[lxix]

LyondellBasell says it links compensation to sustainability goals, but the mechanism is unclear

In 2022 the company said that "[it] added a new Sustainability metric to [its] annual bonus program, with payout based on achievement of KPIs linked to key pillars of our sustainability strategy. As a result, 30% of our overall bonus payout is now tied to ESG results (20% Safety performance and 10% Sustainability)."[lxx] The metrics for assessing ESG performance are not disclosed.

LyondellBasell says that the Chief Sustainability Officer's renumeration is linked to the achievement of emissions reduction targets, but it does not specify how.[lxxi]

Under the current scheme, just ten per cent of annual bonus payments are linked to 'sustainability' targets for which metrics are not disclosed. This is not a strong financial incentive - in 2021 the company's former CEO was paid almost 1.6 million USD, and received a bonus of over 2.5 million USD.[lxxii]

LyondellBasell's new CEO and board member has experience leading a sustainability-oriented company

LyondellBasell has recently appointed Peter Vanacker as CEO, who was President and CEO of Neste from 2018 until his appointment. In 2018, commenting on the publication of the Intergovernmental Panel on Climate Change's report on 1.5°C, Mr Vanacker said:

> **"The world's leading scientists provided us a target to reduce climate change. We must bravely embrace it and continue developing new solutions for reaching it together… Right now, every fraction of a degree of warming counts. The outlook surrounding this challenge, however, should be one of hope, not fear."**[lxxiii]
>
> **- Peter Vanacker, CEO, *LyondellBasell***

The appointment of a new CEO, who has spoken positively about the need for industry to transition to limit global warming to 1.5°C, is welcome. However, it is unclear how the company considers knowledge or experience of sustainability, decarbonisation, or climate risk management when appointing board members or assessing the board's competencies.

The company audits the board's competencies, but it is not clear how it assesses climate competencies

The company highlights that "one of [its] Directors, Robert Dudley, is Chairman of the international industry-led Oil and Gas Climate Initiative"[lxxiv], a consortium of leading oil and gas CEOs including those of Exxon Mobil, Chevron, Aramco and BP. The consortium says it supports Paris goals and wants to reduce emissions in the energy sector by reducing methane leaks and investing in carbon capture.[lxxv]

LyondellBasell says that its Nominating and Governance Committee considers "climate-related competence" and "involvement with other organizations which engage with climate related issues" when nominating candidates.[lxxvi] However, beyond the newly appointed CEO the board does not appear to reflect experience and understanding of sustainability, decarbonisation or climate risk management issues. This is important at a moment when the board needs to guide LyondellBasell's decision making around the company's transition planning.

Recommendations to LyondellBasell and its investors

LyondellBasell must:

- Link executive renumeration to delivery against a 1.5°C aligned emissions reduction target in future pay awards; and
- Explain how the board's composition will reflect experience of sustainability, decarbonisation, and climate risk management.

Investors should ask LyondellBasell:

- Will the company link executive renumeration to delivery against a 1.5°C aligned emissions reduction target in future pay awards?
- Will the company explain how the board's composition will reflect experience of sustainability, decarbonisation, and climate risk management?

11. Disclosures and assessment of climate-related risks

The Standard:
The company discloses comprehensively against the recommendations of the Taskforce for Climate-related Financial Disclosures, the Carbon Disclosure Project Questionnaire, and the additional requirements in this benchmark.
Metrics for assessment:
• Please see Section 10 of the full benchmark

The complete metrics for assessment of this standard are given in the full version of the benchmark.

Is LyondellBasell aligned with the benchmark?

LyondellBasell's disclosures are not aligned with the benchmark.

LyondellBasell discloses against the two leading disclosure frameworks

LyondellBasell publishes an index of its disclosures against the recommendations of the Task Force for Climate-related Financial Disclosures,[lxxvii] and also completes the climate change questionnaire from the Carbon Disclosure Project.[lxxviii]

LyondellBasell has internal processes to identify, assess and manage risks, but its disclosures are incomplete

LyondellBasell has an internal process for identifying, assessing and managing risks, which includes a specific climate change risk management process.[lxxix] The company considers the types of risks specified in the *examples* given by the Task Force on Climate-related Financial Disclosures. [lxxx]

Though LyondellBasell does disclose identified climate-related risks[lxxxi] the detail with which risks are described varies. The Carbon Disclosure Project questionnaire requires companies to disclose 'substantial risks', and LyondellBasell's disclosures here are detailed and comprehensive. Thresholds for classifying a risk as 'substantial' are disclosed and substantial risks are described clearly, with precise terminology to define likelihood and impact, and estimations of minimum and maximum financial impact. [lxxxii] This allows investors to understand a risk, its likelihood, how the company may be affected and how the company is managing it.

However, the company describes several other risks in public documents, which are presumed not to have met the 'substantial' thresholds set by the company, at a high level with language that is sometimes vague around likelihood and impact. To give one example[lxxxiii]:

> **"…The cost associated with our GHG emissions reduction goals could be significant. Failure to achieve our emissions targets could result in reputational harm, changing investor sentiment regarding investment in LyondellBasell or a negative impact on access to and cost of capital."**
>
> ***- LyondellBasell***

LyondellBasell is using climate scenarios to inform its risk assessment process, but not a 1.5°C scenario

LyondellBasell says that it has "a transition plan which aligns with a 1.5°C world". [lxxxiv] However the temperature alignment of its low warming scenario, which is used to test the resilience of its future strategy, is disclosed to be "1.6-2 degrees".[lxxxv]

It is inconsistent for LyondellBasell to say that the company's transition plan is aligned with a 1.5°C world if it is not stress testing that transition plan with a 1.5°C scenario, specifically a low/no overshoot scenario. Without doing this the company cannot test its resilience against the physical and transitional risks that may materialize under these specific conditions.

It is inconsistent for LyondellBasell to say that the company's transition plan is aligned with a 1.5°C world if it is not testing the resilience of that plan against a 1.5°C scenario.

The company uses qualitative climate scenarios (descriptive narratives, rather than mathematical modelling of quantitative data) to assess the resilience of its strategy under future warming scenarios. It said in 2021 that it intended to add quantitative elements by 2023.[lxxxvi] The company has developed a well-below 2°C scenario and a 4°C "business as usual" scenario, but not a 1.5°C low/no overshoot scenario.[lxxxvii] The scenarios cover all geographic locations and business segments.

Some examples of the "driving forces" – "the underlying reasons for change in the magnitude of the probability, consequence, vulnerability, and velocity of the risks" – used to shape these scenarios are named but not described in detail.[lxxxviii] Nor does the company describe in detail how it is affected under its scenarios. Again, findings are summarised but without clear indications or ranges of likelihood or impact:

> **"International climate change policy may result in increases in carbon pricing through carbon taxation, emission trading schemes, emission caps and/or carbon border mechanisms, with an indirect impact on the costs of our operations and price of goods."**[lxxxix]
>
> ***- LyondellBasell***

The company must disclose more details of its scenario inputs

The underlying assumptions that inform climate scenarios, such as the assumed trajectory of carbon pricing or the assumed availabilities of different feedstocks over time, will have a significant effect on how the company performs under those scenarios. Without knowing the details of these assumptions, it is not possible to verify whether the scenarios are realistic, and therefore ultimately whether the company's strategy is credibly resilient to a 1.5°C future.

The company does not disclose its capital spending plans

As discussed in section four, capital spending is a critical indicator of whether a company is aligning its operations with 1.5°C. The company's decision not to disclose this information means this is not possible to assess.

Figure 8: CAPEX data is not disclosed by LyondellBasell in their CDP questionnaire

Financial metric	Percentage share of selected financial metric aligned with a 1.5°C world in the reporting year (%)	Percentage share of selected financial metric planned to align with a 1.5°C world in 2025 (%)	Percentage share of selected financial metric planned to align with a 1.5°C world in 2030 (%)
CAPEX			

Source: Carbon Disclosure Project (2022), *Climate Change – LyondellBasell.*

Recommendations to LyondellBasell and investors

To show investors that LyondellBasell is resilient to climate-related risks and whether its transition plan is aligned with a 1.5°C world, it must improve the quality of its disclosures. The company must test its strategy against a 1.5°C low/no overshoot scenario and disclose all inputs of its scenarios in detail.

LyondellBasell must:

- Disclose in full its assessments of climate related risks to specific sections of the company's business and in different geographies as appropriate, as per the conditions in ShareAction's benchmark;
- Use a 1.5°C low/no overshoot scenario to test the resilience of the company's strategy, and disclose all of the inputs of the scenario in detail; and
- Disclose capital spending on new and existing assets broken down by the type of asset, and by plant/facility, across all geographies.

Investors should ask LyondellBasell:

- Will the company disclose in full its assessments of climate related risks for specific sections of the its business and in different geographies as appropriate, as per the conditions in ShareAction's benchmark?
- Will the company use a 1.5°C low/no overshoot scenario to test the resilience of the its strategy, and disclose all of the inputs of the scenario in detail?
- Will the company disclose capital spending on new and existing assets broken down by the type of asset, and by plant/facility, across all geographies?

Appendix

Disparity between LyondellBasell's 2030 targets and UTS 1.5°C no-overshoot pathway 2030 targets

LyondellBasell's projected 2030 emissions if it meets its own targets						
	Scope 1 (MtCO2e)	Scope 1 % '19 baseline	Scope 2 (market-based, MtCO2e)	Scope 2 % '19 baseline	Scope 3	Scope 3 % '19 baseline
2030	10889709.6	-25.3	5336290.4	-36.1	Target not set	Target not set
LyondellBasell's projected 2030 emissions if the company aligned with the OECM 1.5°C no-overshoot pathway						
2030	8163680	-44	2921450	-65	/	-52
LYB – OECM pathway emissions gap						
	-2726029.6	/	-2414840.4	/	/	/

Source: ShareAction analysis.

LyondellBasell's 2021 emissions

Emissions type	MtCO2e	% total
Total Scope 1	16,183,103.59	13.75482
Total Scope 2 (market based)	7,738,385	6.577236
Total Scope 1+2	23,921,488.59	20.33205
Total Scope 3	93,732,574	79.66795
Purchased goods and services	38,419,546	32.65467
Capital goods	1,388,616	1.180253
Fuel-and-energyrelated activities (not included in Scope 1 or 2)	1,173,409	0.997338
Upstream transportation and distribution	357,677	0.304007
Waste generated in operations	902,425	0.767016
Business travel	584	0.000496
Employee commuting	59,034	0.050176
Downstream transportation and distribution	390,812	0.33217
Use of sold products	30,909,441	26.27146
End of life treatment of sold products	13,430,630	11.41536
Investments	6,700,400	5.695001
Total purchased goods, use and disposal of sold products	82,759,617	70.34149
Total emissions	117,654,062.59	100

Source: Carbon Disclosure Project (2022), *Climate Change – LyondellBasell*

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