

## A Critical Crossroads: Is Europe serious about competitiveness, defence and the green economy in the context of the proposed OEL?

Cobalt is an EU critical and strategic raw material, as well as being classified as a NATO critical mineral given its essential role in defence. Europe's political goals – security, circular economy, energy transition, and strategic autonomy – all necessitate a growing cobalt sector in Europe. This can be done safely.

- **We support a 20 µg Co/m<sup>3</sup> (inhalable) Occupational Exposure Limit for cobalt.** We additionally support the introduction of a respirable limit value at 4.2 µg Co/m<sup>3</sup> (respirable). These values are effectively the lowest in the world and would make a Europe a leader in terms of strict worker protections. Scientific and socio-economic evidence shows this limit value is the best for protecting workers and – whilst hard for industry – causes the least harm to the EU's broader political goals of the options proposed.
- **In contrast, the 10 µg Co/m<sup>3</sup> (inhalable) and 2.5 µg Co/m<sup>3</sup> (respirable) values are net negative for worker protection, and would additionally devastate Europe's cobalt industry, with corresponding impacts for Europe's competitiveness, security, defence and green economy.** In reality, adopting this value would result in a significant decline in well-protected European jobs and would divert investment to jurisdictions that have looser regulation. The result would be increased reliance on non-EU supply, greater political risk, more expensive manufacturing in Europe, and greater cobalt exposure for workers globally.

Europe will miss its Critical Raw Material Act benchmarks for cobalt. With the introduction of this legislation, it will likely find itself significantly further away from them in 2030 than it was in 2024. **But it's not too late to protect workers and create a better Europe by implementing a 20 µg Co/m<sup>3</sup>.**

### 1. Background and context

**"Today a single country controls 75% of the processing of cobalt [...] This is a critical situation– no doubt about it. But there is nothing inevitable about it. With the right policies, we can shore up our security, and build our independence. And this is what Europe is up to today."**

*Opening keynote speech by President von der Leyen at the 'One Year After the Draghi Report' Conference, 16 September 2025.*

Europe has set itself a political ambition to diversify its cobalt supplies and increase domestic production. This stems from concerns about the resilience of the defence industrial base, capacity to act with strategic autonomy, competitiveness of green economy value chains and the need to ensure high standards of production and guarantee resilience of supplies for industry.

Cobalt is essential for modern lithium-ion batteries (used in portable electronics and electric vehicles, as well as batteries for defence purposes, like drones) and wider aerospace and defence, including jet engine turbines, missiles, sensors and avionics and specialist permanent rare-earth magnets (samarium cobalt alloys)<sup>1</sup> the production of fuels, for AI and in the generation of both gas and nuclear energy. Cobalt is essential to hard metal/cemented carbide tools required for a vast range of machining and construction, mining and other industrial applications. Many of these will simply not work without cobalt, which is why in December 2024 NATO designated it a critical mineral for defence, and the EU made it a critical and strategic raw material. In October

<sup>1</sup> [Cobalt Market Report 2024](#)

2025, China announced that exports of batteries and cathode active materials would be subject to export controls and classified them as dual use products on national security grounds<sup>2</sup>.

Further illustrating the EU's ambition is the fact that cobalt has been central in several items of legislation – including being made a critical and strategic raw material in the Critical Raw Materials Act, with cobalt Strategic Projects – as well as recycling targets set in the Battery Regulation.

To achieve its 2030 Critical Raw Materials Act benchmarks, European production of cobalt will need to increase by 95% by 2030, and by the same date, recycled production needs to increase by 283%<sup>3</sup>.

Demand for cobalt is projected to surge 350% by 2050<sup>4</sup>. In the context of the Critical Raw Materials Act's benchmarks, overall European production will have to grow at least this fast to maintain its current share of domestic production in 2050, and faster still if it wants to meet the EU's own benchmarks.

By 2050, secondary supply from end-of-life batteries has the theoretical potential to provide 65% of Europe's total cobalt demand<sup>5</sup>. The challenge will be ensuring there is enough recycling capacity to produce this volume, given the extraordinarily rapid pace of growth that would be required to achieve this.

**In short – if Europe's cobalt industry succeeds, then Europe succeeds in its political objectives.**

However, in reality it is likely that Europe will fall further behind on its benchmarks in 2030 than it was in 2024 – even before factoring in the adoption of this Occupational Exposure Limit. By 2050 its dependencies could be many times greater than they are today.

The reason we reach this conclusion is that many companies in the cobalt industry already face existential market conditions. Prices have plummeted in recent years as a result of global oversupply and, as a result, most European manufacturers are struggling to sustain their operations. While recent bans and subsequent restrictions on exports from the Democratic Republic of Congo (DRC) has led to rising prices, it's unclear what will happen once these controls are lifted.

For example, in March 2024, Jervois' cobalt refinery expansion project was designated an EU Strategic Project<sup>6</sup> but in December 2024 the parent company filed for Chapter 11 bankruptcy protection<sup>7</sup>. The Commission's official Impact Assessment – published July 2025 – implies companies like Jervois can afford compliance with the cobalt Occupational Exposure Limit because costs would have been less than 1% of turnover<sup>8</sup>. We do not understand why turnover would be used in this context. Turnover bears no relation to the cash on hand or profitability of a business, especially given the impact of current market conditions.

When we look at cobalt and its supply chains globally, Europe is falling behind in the race. **While the United States provides proactive support to their cobalt industry, Europe is actively kicking theirs whilst it's down.**

## 2. Cobalt market today

In 2024 – the last full year for which we have numbers – cobalt demand exceeded 200,000 tonnes globally for the first time<sup>9</sup>. Despite growing demand, supply is growing even faster leading to declining prices.

Of this, around 76% of global cobalt came from one source, the DRC. In 2023, the largest share of the output came from Chinese miners (62%), with a small amount of Japanese company Sumitomo (3%), and with no North American miners present. European miners Glencore and ERG comprise 35% of DRC output.

Chinese companies dominated refined cobalt production in 2024, producing 78.6% of global supply. Finland is currently the second largest refiner of cobalt at 7.2% with operations in Kokkola, the largest refinery outside of

<sup>2</sup> Benchmark, "[China extends export controls to lithium ion batteries and battery materials](#)"

<sup>3</sup> Benchmark Minerals Intelligence data: "[Visualizing the EU's Critical Minerals Gap by 2030](#)"

<sup>4</sup> KU Leuven, "[Metals for Clean Energy](#)", published April 2020

<sup>5</sup> KU Leuven, "[Metals for Clean Energy](#)", published April 2020

<sup>6</sup> [Official Journal of the EU](#)

<sup>7</sup> Mining Weekly "[KPMG appointed voluntary administrators of Jervois Global](#)"

<sup>8</sup> European Commission: "[Staff Working Document](#)"

<sup>9</sup> Cobalt Institute, "[Cobalt Market Report 2024](#)"

China, anticipating adverse effects from the OEL. Remaining refiners are Canada (2.7%), Japan (1.9%), Madagascar (1.8%), Indonesia (1.7%), Norway (1.4%) and Australia (1.4%).

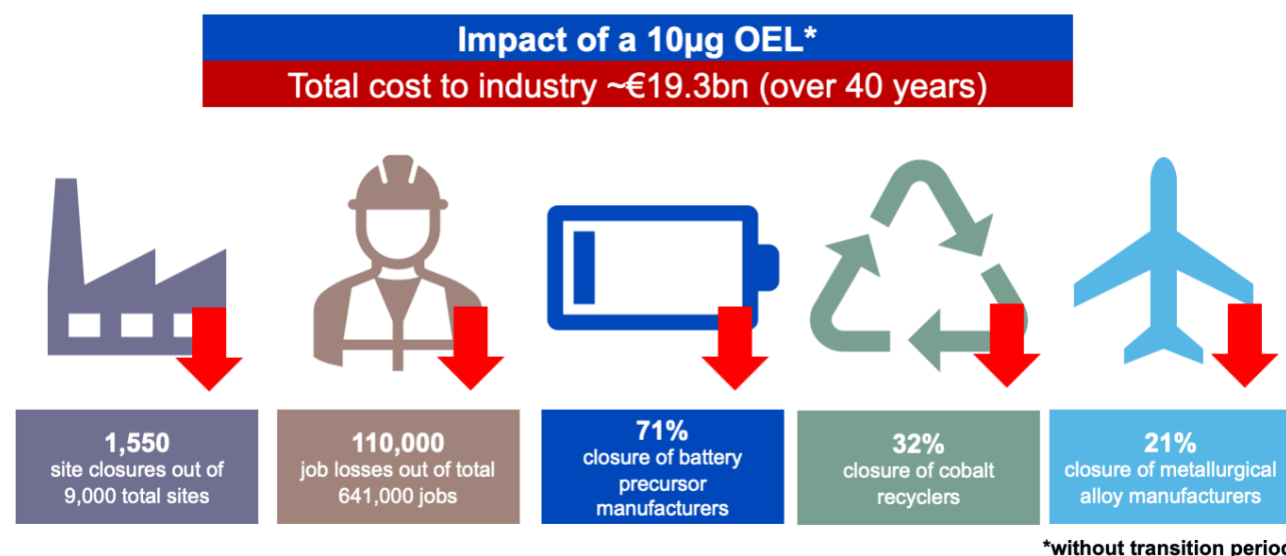
Battery demand remains a major source of growth (12% year on year growth for portable electronics, and 26% year on year growth for EVs<sup>10</sup>), but the second largest source of growth is superalloys, primarily driven by increased defence spending. There are also many products where cobalt is used in small amounts, but without cobalt the product would not function.

For the third consecutive year, demand growth was outpaced by supply additions in 2024. By the end of 2024, cobalt prices were at historic lows<sup>11</sup>. Prices of cobalt have fallen from a high of ~81,000 USD/per tonne in April 2022 to a low of ~21,000 USD/per tonne in March 2025. This sustained period of low prices has caused existential market conditions for many producers.

This collapse led the Democratic Republic of the Congo to impose an export ban on cobalt in February 2025 followed by a quota system that will drastically limit exports, which has prompted a price rally. There remain uncertainties as to how markets will respond to the new quota system.

### 3. Why a 20 µg is best for Europe

The full impact of the OEL cannot be completely known, as the studies that assess the impact (eftec and the Commission's study) were done prior to the current period of extended economic difficulty and without a transition period being studied. Our best estimate – from a Cobalt Institute-commissioned third-party study by eftec<sup>12</sup> – shows significant impacts at 10µg without transition period:



The previous section highlights how Europe will not achieve its Critical Raw Materials Act benchmarks without rapid growth. Should the 10 µg OEL push the industry to collapse, it would all but eliminate prospects for additional European investment and further undermine progress toward key EU benchmarks.

Importantly, one of the main anticipated impacts of the 10 µg OEL, a 71% reduction in European manufacturing of battery precursors operations, would take place just as China has imposed export controls on cathode active materials and batteries and certain cobalt-containing rare earth magnets<sup>13</sup>.

The figures on the graphic above do not account for the impact of the proposed six-year transition period. Our assessment concludes that the transition period will result in an 8% reduction in costs. This will not be enough to offset the damage done to industry.

<sup>10</sup> Cobalt Institute, "[Cobalt Market Report 2024](#)"

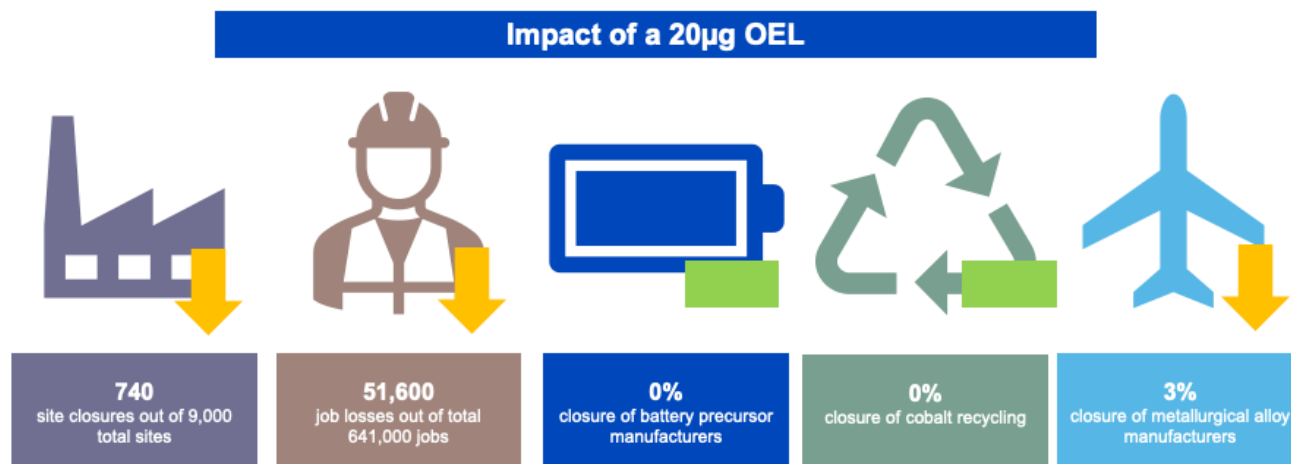
<sup>11</sup> Cobalt Institute, "[Cobalt Market Report 2024](#)"

<sup>12</sup> [OEL socio economic impact assessment conducted by eftec](#) commissioned by the Cobalt Institute.

<sup>13</sup> Benchmark, "[China extends export controls to lithium ion batteries and battery materials](#)"

Industry is being pragmatic. 20µg does mean significant job losses (55,000) and site closures (740), including the loss of 3% of metallurgical alloy manufacturing. But the impacts are drastically reduced.

The Cobalt Institute supports a 20µg<sup>14</sup> because it objectively optimises both worker protection and economic outcomes. Higher values than 20µg would likely be easier for industry but would lack the ambition of 20µg. Below 20µg we observe worse outcomes from worker protections and jobs.



#### 4. Global context

The following graph shows that no country has adopted a value as low as the 10µg<sup>15</sup> proposed by the Commission. In fact, some major global economies have values that are far higher.

The Commission's study assumes that closures have an opportunity cost of production moving to zero. In reality, many companies operating in Europe also have operations elsewhere and can move production and investments between facilities. It does not mean that companies stop producing cobalt, it could mean they continue producing cobalt, but outside the EU for import back into the EU.

Blue countries are EU Member States:

<sup>14</sup> 20µg refers to 20µg Co/m<sup>3</sup> inhalable. We support a respirable fraction OEL, but don't quote this for the sake of brevity.

<sup>15</sup> 10µg refers to 10µg Co/m<sup>3</sup> inhalable. We support a respirable fraction OEL, but don't quote this for the sake of brevity.

| OEL (Gestis)                     | µg/m <sup>3</sup> | OEL (Gestis)               | µg/m <sup>3</sup> |
|----------------------------------|-------------------|----------------------------|-------------------|
| <b>EC proposed, permanent</b>    | <b>10</b>         | South Korea                | 20                |
| Denmark                          | 10*               | Spain                      | 20                |
| <b>EC proposed, transition</b>   | <b>20</b>         | Sweden                     | 20                |
| <b>Cobalt Institute proposal</b> | <b>20</b>         | Germany                    | 20***             |
| Belgium                          | 20                | The Netherlands            | 20                |
| Canada                           | 20                | Australia                  | 20**              |
| Finland                          | 20                | South Africa               | 40                |
| Hungary                          | 20**              | People's Republic of China | 50                |
| Ireland                          | 20                | Romania                    | 50                |
| Israel                           | 20                | Switzerland                | 50                |
| Japan                            | 20                | Austria                    | 100****           |
| New Zealand                      | 20                | USA                        | 100               |
| Norway                           | 20                | United Kingdom             | 100               |
| Poland                           | 20                | Latvia                     | 500               |
| Singapore                        | 20                |                            |                   |

\*total fraction, commensurate with 20µg  
 \*\* Lower value, not sourced from Gestis  
 \*\*\*Expected November 2025  
 \*\*\*\* 500 for certain sectors



EU "competitors"



Countries with 20µg OELs

## 5. Shortcomings in the Commission's assessment

### 5.1. Key messages

The European Union's Better Regulation (BR) framework (EC, 2025a) requires actions taken to be based on the best available evidence, transparent decision-making, and proportionate impacts on society, the economy, and the environment.

European Commission guidelines state that measures must not go beyond what is necessary to achieve policy objectives and that financial and administrative burdens should be minimised (European Union, 2012). Non-compliance with the principles of subsidiarity and proportionality may be used to challenge the lawfulness of Union acts before the Union's courts (European Union, 2012).

According to the Commission's own data and criteria, the proposed OEL is not proportionate to the expected health benefits. Both the EC and etec assessments show that costs exceed benefits, contrary to Better Regulation principles.

According to EC IA, around 95 % of affected companies are SMEs. No evidence has been provided that the six-year transitional period would substantially reduce compliance costs or make the proposal affordable for SMEs.

The European Commission states that the proposal has broad stakeholder consensus, yet this is not evident within the cobalt industry. Both industry and worker representatives raised concerns about feasibility, reliance on PPE and competitiveness impacts.

## 5.2. Critical assessment of the justification for the Cobalt BOELs

A positive opinion from the Regulatory Scrutiny Board (RSB) is required before an intervention proceeds. The RSB's opinion on the EC's cobalt IA was "positive with reservations". Key reservations were that the impact assessment does not appropriately demonstrate the proportionality of the preferred policy option and that the comparison and justification of options are unclear (RSB, 2025).

*"On this basis, the report should better demonstrate the proportionality of the preferred policy package, in particular regarding cobalt and polycyclic aromatic hydrocarbons (PAHs). The coherence with other initiatives aimed to build EU strategic autonomy, such as Critical Raw Materials and Chips should be better reflected. The coherence of the options with underlying legal frameworks, including provisions on SMEs should be assessed" (RSB, 2025).*

These reservations indicate that proportionality and coherence – the foundation of the BR framework – have not been adequately demonstrated.

This indicates that the concerns expressed by the cobalt industry throughout this paper are also shared by the RSB.

## 5.3. Evidence base and methodological divergence

Results from eftec (2023<sup>16</sup>), particularly for costs, differ substantially from those presented in the Commission's Impact Assessment. It is believed that the Commission's impact assessment underestimates compliance costs for achieving a workplace exposure limit of 10 µg/m<sup>3</sup>, and therefore also for the proposed OEL (which is stated to be 8% lower).

Costs per company are unrealistically low. eftec (2023<sup>17</sup>) estimated annual average costs of complying with 10 µg/m<sup>3</sup> is ~€30,000 per year for SMEs, when PPE is used alongside other measures. eftec (2023<sup>18</sup>) reports significantly higher rates of non-compliance than the Commission's study (2025b). For example, 15 manufacturers of cobalt and cobalt compounds responded to eftec's stakeholder survey, reporting an average non-compliance rate of 36%. In contrast, EC (2025b) reports 100% compliance for manufacture of cobalt and cobalt alloys (with an estimated six companies in total). Across all broad uses, eftec estimates an average compliance rate of 64%, while the EC reports 90 % compliance.

The Commission assumes that the vast majority of companies can comply with 10 µg/m<sup>3</sup> using simple PPE upgrades, and additional monitoring and administrative costs are very low. This does not align with what stakeholders have reported in the two stakeholders surveys carried out by eftec. Additional costs of monitoring respirable fraction alone were reported to induce significant costs, and a large share of the stakeholders stated that they needed to implement engineering measures in addition to PPE.

These results of eftec's analysis show that, although eftec's analysis indicates higher absolute costs and benefits than the Commission's Impact Assessment both assessments confirm that costs by far outweigh the benefits. Furthermore, the studies confirm that, for society as a whole, a BOEL of 20 µg/m<sup>3</sup> is a preferable option over both 10 µg/m<sup>3</sup> and the transitional option.

## 5.4. Use of turnover

The Commission's impact assessment assesses the affordability of risk management options against company turnover. We do not understand why this metric was chosen, as it tells you nothing about a company's ability to absorb new costs. A company with a numerically large turnover could be extraordinarily profitable or be on the edge of (or in) bankruptcy<sup>19</sup> with no ability to pay existing costs, never mind future regulatory costs. Companies with high turnovers could operate on razor-thin margins, where new costs push them into making a loss. SMEs are more likely to operate with low profit margins, making them more vulnerable to increases in costs.

<sup>16</sup> [OEL socio economic impact assessment conducted by eftec](#) commissioned by the Cobalt Institute.

<sup>17</sup> [OEL socio economic impact assessment conducted by eftec](#) commissioned by the Cobalt Institute.

<sup>18</sup> [OEL socio economic impact assessment conducted by eftec](#) commissioned by the Cobalt Institute.

<sup>19</sup> Mining Weekly ["KPMG appointed voluntary administrators of Jervois Global"](#)

Affordability should instead be assessed by examining whether the required investment or operating costs would threaten a company's financial viability. Behavioural responses – such as whether to implement risk management options, substitute, or discontinue production – are also often influenced by the relative cost of alternative options. For example, if a company already operates facilities outside the EU, relocating certain production lines may be less costly than implementing risk management options domestically.

The Commission's impact assessment acknowledges that SMEs will be especially affected by the compliance costs of the proposed OEL (EC, 2025b; EC, 2025d). No evidence has been provided to support the claim that the transitional period will support SMEs in complying with the more stringent OEL. The transition period is stated to reduce costs (and benefits) by only 8% (EC, 2025d, page 167), so it is unclear how this will sufficiently support SMEs.

## 5.5. Additional commentary

A fuller commentary on the impact assessment is provided as an Annex to this response. This was developed by eftec.

## 6. Conclusion

**Well protected jobs in Europe: ensuring cobalt Occupational Exposure Limits support a safe, competitive and strategically autonomous Europe**

**A limit of 20 µg Co/m<sup>3</sup>, already in place in many countries, strikes the right balance between safety, feasibility, and support for Europe's strategic goals.**

- **It protects workers:** There are no adverse health effects in the workplace at 20 µg, based on large human health datasets. *This data is publicly available, and we are happy to share and talk it through bilaterally.*
- **It is proven in practice:** Already adopted by most EU Member States, the values demonstrate both effectiveness and feasibility for industry. The values are five times stricter than the US limits (Federal levels) and more than twice as strict as China's.

**Member States should amend the proposal to a fixed 20 µg/m<sup>3</sup> (inhalable) limit, and we support adding a 4.2 µg/m<sup>3</sup> (respirable) limit. These values protect workers, secure jobs, and drive growth in critical sectors such as batteries and defence.**

## 7. About the Cobalt Institute

The Cobalt Institute is the trade association representing the global cobalt industry. We have more than 60 members that operate throughout the value chain, from end users like battery manufacturers, to refiners and processors, miners, recyclers, traders on the financial markets and everything in between. Our membership spans six continents and all the major jurisdictions.

**For more information contact:**

**Mike Blakeney**  
Head of Government and Public Affairs  
Cobalt Institute  
[mblakeney@cobaltinstitute.org](mailto:mblakeney@cobaltinstitute.org)

**Sarah Schneider**  
Policy and Communications Manager  
Cobalt Institute  
[sschneider@cobaltinstitute.org](mailto:sschneider@cobaltinstitute.org)

**Dr Vanessa Viegas DABT, ERT**  
Head of Scientific and Regulatory Affairs  
and Principal Toxicologist (Human Health)  
Cobalt Institute  
[VViegas@cobaltinstitute.org](mailto:VViegas@cobaltinstitute.org)

## **Annex – Impact Assessment: Binding Occupational Exposure Limits for cobalt metal and cobalt substances**

The executive summary of the report is provided below, with links to the full report provided at the end.

### **Purpose**

This report is prepared to support the Cobalt Institute's industry-wide advocacy efforts concerning the introduction of a European Union (EU) wide Binding Occupational Exposure Limit (BOEL) for cobalt metal and inorganic cobalt compounds.

This project assessed the costs and benefits of implementing four potential BOELs for the cobalt substances that are in scope (see below) in the EU-27 over the next 40 years, compared to the baseline of current manufacturing, import and uses, and the health impacts of the current exposure levels. The information on costs and benefits is gathered from existing data, previous studies and a new questionnaire effect prepared for this purpose.

### **Scope of assessment**

The scope of the impact assessment covers 40 substances of which 14 are directly in scope and 26 are indirectly in scope (the full list is presented in Section 1.4.1). 24 broad uses of cobalt substances have been assessed, and the geographical scope spans the EU-27. The analysis has been carried out for a period of 40 years from 2022 to 2061.

### **Baseline**

The key results derived in this report regarding the baseline are as follows, particularly those that are important in determining the costs and benefits of BOEL options:

- Estimated current market value of substances in scope manufactured in the EU-27 is around €7.6 billion.
- Across all analysed broad uses (including manufacture and recycling), there are around 7,000 companies in the EU-27, operating an estimated ~9,000 sites, and employing ~641,000 (FTE) workers of which ~72,000 are potentially exposed to cobalt.
- An estimated ~177,000 tonnes per year of cobalt substances are used in downstream uses in the EU.
- Current compliance levels with each of the four BOELs analysed range from 27% for the most stringent BOEL of 1 µg/m<sup>3</sup> to 84% for the least stringent BOEL of 30 µg/m<sup>3</sup>.

### **Alternatives**

Cobalt substances serve different functions depending on their uses; therefore, alternatives could be viable substitutes for some of these functions in some uses but not others. Respondents noted that no R&D activities for the substitution of cobalt substances over the last five years have been fully successful. Some substances, such as iron, nickel, ruthenium, other precious metals, vanadium pentoxide, molybdenum and sulphate are potential alternatives for specific applications, but they are not drop-in replacements (i.e., like-for-like) as they have shortcomings either in technical or economic feasibility, availability, or risk reduction (i.e., hazard profile).

### **Analysis of policy options**

There are four BOEL Policy Options assessed in this report – all inhalable fractions: 30 µg/m<sup>3</sup>, 20 µg/m<sup>3</sup>, 10 µg/m<sup>3</sup>, and 1 µg/m<sup>3</sup>.

Three possible behavioural responses to each BOEL are assessed:

- Implement risk management measures (RMMs) required to comply with the BOELs;
- Substitute substance or process; or
- Cease affected production in the EU, e.g., close product lines, relocation or complete site closure.

Costs are based on the expected behavioural responses to each BOEL. Costs are estimated using data gathered through an industry questionnaire. Following advice from the Cobalt Institute, it is also assumed that every company that continues to use in-scope substances must implement biological monitoring and respiratory exposure monitoring programmes to demonstrate their compliance with the relevant BOEL, unless they already have this in place. Since it is not known whether companies will have to use PPE to comply with a BOEL, costs with and without PPE have been calculated separately.

Benefits of a BOEL comprise the adverse health impacts avoided by reducing exposure levels below the exposure levels of the baseline (no BOEL). Three health endpoints are assessed: Lung cancer, respiratory irritation and restrictive lung disease. The benefits are calculated using exposure levels per broad use and dose response functions for each of the respective health endpoints. All avoided cases associated with the three health endpoints are valued using appropriate (proxy) valuation factors found in literature.

## Results

Chapters 7 – 10 present detailed results of the impact assessment for each the four Policy Options (BOELs), including costs of compliance, social costs (lost jobs) and benefits. A comparison of the impacts across the policy options can be found in Chapter 12. A summary of the key results is presented in **Table ES 1**, which shows that none of the Policy Options has a benefit-cost ratio (BCR) greater than 1, i.e., they all result in net cost to society. The BOEL with the most favourable benefit-cost ratio is the least stringent BOEL of 30 µg/m<sup>3</sup> and the least favourable option is a BOEL of 1 µg/m<sup>3</sup>.

*Table ES 1: Total costs, benefits, and BCR of each Policy Option*

| BOEL                           | Total annual costs<br>(PV € million/year) |     |       | Total annual benefits<br>(PV € million/year) |     |      | Benefit-Cost Ratio (BCR) |                  |                   |
|--------------------------------|-------------------------------------------|-----|-------|----------------------------------------------|-----|------|--------------------------|------------------|-------------------|
|                                | Low                                       | Mid | High  | Low                                          | Mid | High | Low B/<br>High C         | Mid B /<br>Mid C | High B<br>/ Low C |
| <b>30<br/>µg/m<sup>3</sup></b> | 180                                       | 240 | 300   | 10                                           | 13  | 17   | 0.034                    | 0.056            | 0.093             |
| <b>20<br/>µg/m<sup>3</sup></b> | 270                                       | 400 | 530   | 11                                           | 14  | 18   | 0.020                    | 0.036            | 0.066             |
| <b>10<br/>µg/m<sup>3</sup></b> | 430                                       | 570 | 700   | 11                                           | 15  | 19   | 0.016                    | 0.026            | 0.044             |
| <b>1 µg/m<sup>3</sup></b>      | 700                                       | 920 | 1,140 | 12                                           | 15  | 19   | 0.010                    | 0.017            | 0.027             |

*Table notes:*

- “Low” cost estimates are with PPE and use the lower bound number of sites, “High” cost estimates are without PPE and use the upper bound number of sites, and “Mid” cost estimates are the average of “Low” and “High”.
- “Low” benefit estimates use the lower bound number of workers exposed, “High” benefit estimates use the upper bound number of workers exposed and “Mid” cost estimates are the average of “Low” and “High”.
- The total present values (i.e., PVs: sum of discounted future costs) were derived using the recommended rate by the European Commission at 3%, are given in € 2022. Costs and benefits are rounded to the nearest €10 million and € million, respectively.

There is no single most significant cost driver across BOELs. For the most stringent BOEL the lost profit and jobs from companies choosing to cease production in the EU are key drivers, and for less stringent BOELs the costs of monitoring are more important. The sensitivity analysis shows that if no biomonitoring is carried out and the air monitoring costs are halved, the costs of the least stringent BOEL will be reduced by two thirds.

The benefits estimates are highly sensitive to whether PPE is used to demonstrate compliance as well as strongly dependent on the valuation factors. The results from the sensitivity analysis carried out are presented in Section 12.5, which revealed that even under extremely conservative assumptions of maximum benefits and minimum

costs, the benefit-cost ratio is significantly below 1 for all Policy Scenarios. Across all combinations of sensitivities tested, the costs are found to be a minimum of three and a maximum of 250 times higher than the benefits.

Uncertainties are still prevalent in the analysis and associated results, in particular related to the representativeness of the data gathered through an industry questionnaire at the EU level, the levels and distribution of exposure for each broad use, and the omission of further health endpoints. However, considering the large differences between the costs and the benefits, it is deemed unlikely that the overall conclusions would change based on any of the identified uncertainties, as is demonstrated in the sensitivity analysis.

A BOEL may also cause wider economic impacts, including supply risks of cobalt as a critical raw material (CRM), energy production and storage may be adversely affected, and wide-reaching knock-on effects may occur if a large number of companies relocate outside the EU. These non-quantified impacts are therefore of particular concern for the more stringent BOEL, where ~1,550 sites are expected to cease EU production with a corresponding 110,000 jobs lost with a BOEL of 10 µg/m<sup>3</sup>, and these numbers will double with a BOEL of 1 µg/m<sup>3</sup>.

*Link to an online version of the report [here](https://www.cobaltinstitute.org/wp-content/uploads/2025/10/Co_BOEL_Final_report_revised_20102025.pdf):*

[https://www.cobaltinstitute.org/wp-content/uploads/2025/10/Co\\_BOEL\\_Final\\_report\\_revised\\_20102025.pdf](https://www.cobaltinstitute.org/wp-content/uploads/2025/10/Co_BOEL_Final_report_revised_20102025.pdf)