Report to Legislature on EITE Allowance Allocation 2035-2050
Document 1: Best practices for avoiding leakage

The Washington Department of Ecology (Ecology) is preparing a report about no-cost allocation to Emissions Intensive Trade Exposed Industries (EITEs) under the Cap-and-Invest Program.

EITEs are important local industries and manufacturing facilities that produce a variety of products including paper, food, building materials, glass, and airplanes. In establishing the Climate Commitment Act (CCA), the Legislature recognized that EITEs faced unique challenges in reducing their greenhouse gas emissions in the early years of the Cap-and-Invest Program.

The Legislature decided to issue allowances at no cost to these industries through to 2034 and didn't specify the approach to providing no-cost allowances to EITEs for 2035-2050. Ecology is required to prepare a report to the Legislature that offers information and recommendations on how best to proceed. This report will include consideration of:

- Best practices for avoiding leakage (when EITEs relocate or limit their operations)
- Different approaches for measuring the emissions generated by EITEs per unit of production
- Opportunities and barriers for decarbonizing EITEs in Washington
- How to allocate no-cost allowance to EITEs from 2035-2050
- Implications for environmental justice outcomes, local air quality, statewide emissions limits, and revenues generated by Cap-and-Invest auction

Further information on EITEs can be found at Ecology's website: Emissions Intensive Trade Exposed industries - Washington State Department of Ecology

Opportunities to provide report input

Ecology is providing multiple engagement opportunities to make sure EITEs, Tribes, covered entities, community organizations, and other interested parties can provide input into the development of Ecology's report to the Legislature. This includes establishing two advisory groups – EITE Industries Advisory Group and EITE Policy Advisory Group – as well as hosting forums for Tribes, the public, and community organizations.

Ecology is specifically seeking feedback on the approach for allocating no-cost allowances from 2035-2050 as well as understanding the potential impacts on individuals and communities where EITE facilities are located. Comments may be submitted through the electronic platform until Sept. 3, 2025 at 11:59 p.m.

To stay updated on the progress of the report, the advisory groups, and public meetings, sign up for the EITE Industries email list.

Document 1: Review of best practice policies for avoiding leakage and economic harm to businesses (maintaining competitiveness of EITEs)

Disclaimer

This document sets out the draft findings and supporting information from staff review of best practice policies for avoiding carbon leakage and economic harm to businesses in carbon pricing programs. The purpose of the document is to support discussions with advisory groups and enable interested parties and the public to provide specific feedback on the draft findings and information.

The draft findings and information in this document do not represent the official position of Ecology or the Legislature on any policy or issue mentioned in this document. The final report will incorporate feedback received from advisory group members and other interested parties.

Section1: Context and Background

1. In preparing its report to the Legislature on EITE allowance allocation for 2035-2050, the CCA requires Ecology to undertake "…a review of global best practices in ensuring against emissions leakage and economic harm to businesses in carbon pricing programs…" (RCW 70A.65.110(4)(a)).
2. Undertaking this analysis first requires an understanding of key terms and concepts related to emissions leakage in carbon pricing programs, including how the CCA addresses EITEs and emissions leakage, which are explained below.
3. This document is structured as follows:
    a) Section 1: Context and background, including clarification of key terms and concepts and methods used in the review
    b) Section 2: Draft key findings of the review of best practice policies for avoiding leakage and economic harm to businesses (maintaining competitiveness)
    c) Section 3: Detailed findings and supporting information, including:
        - Carbon leakage theory, empirical evidence, and leakage risk assessments
        - Review of policies for avoiding carbon leakage under carbon pricing programs
        - Analysis of how Washington's approach to leakage risk/EITE allowance allocation compares to other jurisdictions.
4. This document should be read in conjunction with **Document 2: Methods for developing greenhouse gas benchmarks**, which provides draft findings and information from the staff review of alternative methods for developing greenhouse gas benchmarks for EITE facilities.

Clarification of key terms and concepts used in this document

Leakage

5. In establishing the Cap-and-Invest Program the Legislature expressed its intent to minimize or avoid leakage of emissions from emissions-intensive, trade-exposed industries (EITEs) in two sub-sections of the CCA as follows:

    *"…The legislature intends to create climate policy that recognizes the special nature of emissions-intensive, trade-exposed industries by **minimizing leakage** and increased life-cycle emissions associated with product imports. The Legislature further finds that climate policies must be appropriately designed, in order to **avoid leakage** that results in net increases in global*

greenhouse gas emissions and increased negative impacts to those communities most impacted by environmental harms from climate change…" RCW 70A.65.005(6)

*"The legislature intends to promote a growing and sustainable economy and to **avoid leakage** of emissions from manufacturing to other jurisdictions. Therefore, the legislature finds that implementation of this section is contingent upon the enactment of RCW 70A.65.110"* RCW 70A.65.070(5)

6. The CCA defines the term 'leakage' as follows:

> *"**Leakage**" means a reduction in emissions of greenhouse gases within the state that is offset by a **directly attributable** increase in greenhouse gas emissions outside the state and outside the geography of another jurisdiction with **a linkage agreement with Washington.**[1]* RCW 70A.65.010(43)

7. This definition of leakage focuses exclusively on emissions reductions occurring within Washington that are offset by a directly attributable increase in emissions out of state. However, economists sometime differentiate between 'output leakage', whereby production shifts to unregulated jurisdictions in the short-term, and 'investment leakage', whereby financial investments shift to unregulated jurisdictions in the longer-term. In addition, some economists have identified a third type referred to as 'fuel price leakage', whereby reductions in demand for fossil fuels in one jurisdiction results in lower prices and increased consumption elsewhere.[2]
8. The concept and definition of leakage was also discussed with the EITE Advisory Groups in October and December 2024. Members of the advisory groups emphasized the importance of considering not just potential increases in global emissions, but the potential economic and environmental justice impacts of leakage on the communities where EITEs are located. While these impacts were deemed out of scope in the context of the review of best practice policies for avoiding leakage, Ecology will be compiling information on the economic and environmental justice impacts of EITEs in Washington to help assess the potential impacts of EITE allowance allocation policies on those issues.
9. For the purpose of its review of policies for avoiding leakage, staff have used the definition provided in the CCA, which focuses on emissions leakage but may also encapsulate output and investment leakage.

Economic harm (maintaining competitiveness)

10. The term 'economic harm' is not defined in the CCA, nor is it defined in any other statute in Washington. In reviewing the available literature, staff identified that when assessing the impacts of carbon pricing on EITEs the most common approach is to focus on the concept of 'maintaining competitiveness', which is generally defined as the capability of EITEs to maintain market share and profitability. A member of the EITE Industries Advisory Group suggested the legislature intentionally did not define the term economic harm so it could be interpreted

[1] This definition excludes any leakage of emissions to a jurisdiction that may be linked to the Washington market in the future (such as California or Québec) but would exclude leakage of emissions to a non-linked jurisdiction that may have comparable carbon pricing policies, such as the EU.
[2] Marc Hafstead, 'Leakage Mitigation Measures under Cap & Trade Programs', Presentation to EITE Industries Advisory Group on October 17, 2024.

broadly to encompass anything associated with the financial wellbeing or competitive standing of EITEs. However, there is no evidence for this perspective in the statute and staff have not found any other carbon pricing programs or policy analyses that have defined or assessed the concept of 'economic harm' to businesses/EITEs.

11. For the purpose of its review of policies for avoiding leakage, staff have interpreted 'economic harm' as referring to maintaining the competitiveness of EITEs in the face of domestic and/or international competition from businesses who are not subject to comparable carbon pricing policies.

Methods used to inform the review

12. The primary methods for completing Ecology's review included:
    a) Discussions with the EITE Industries Advisory Group and EITE Policy Advisory Group and subject matter experts on leakage mitigation policies
    b) Identification and review of literature documenting best practices for mitigating leakage and maintaining the competitiveness of EITEs within carbon pricing programs
    c) Comparative analysis of WA approach to EITE allocation compares to other jurisdictions.

Section 2: Key findings of review of policies for avoiding leakage and economic harm to businesses (maintaining competitiveness)

13. Jurisdictions that have implemented carbon pricing policies have almost always included policies designed to mitigate leakage and maintain the competitiveness of EITEs. This is to ensure that these programs are supporting global reductions in greenhouse emissions, and not simply resulting in the displacement of production and emissions to other jurisdictions. While the empirical evidence of leakage risk is mixed, it remains an important consideration in the design and implementation of carbon pricing programs.
14. Best practices policies for avoiding leakage and maintaining competitiveness of EITEs under carbon pricing programs are generally considered to be those policies that:
    a) Establish a level playing field for EITEs producing within the jurisdiction vis-à-vis competitors in jurisdictions without comparable carbon pricing policies.
    b) Identify and target assistance to industrial sectors that are most at risk of leakage.
    c) Maintain incentives for EITEs to decarbonize their operations and reward efficient production within the jurisdiction.
    d) Align with the overarching goal of carbon pricing programs – to reduce emissions in line with jurisdictional (and global) emission reductions targets.
15. Within the context of carbon pricing programs, there are two primary policies that have been adopted by jurisdictions to mitigate carbon leakage and maintain competitiveness of EITEs:
    a) The allocation of free or 'no cost' allowances to industries deemed energy- or emissions-intensive and trade-exposed.
    b) The establishment of Carbon Border Adjustment Mechanisms (CBAM) which impose a carbon price on imports of energy or emissions intensive products from countries with less stringent climate policies.
16. The most common approach for addressing leakage risk within carbon pricing program is the allocation of free or no-cost allowances to EITEs. This approach involves first identifying which sectors and facilities are exposed to leakage risk, most often using metrics to assess emissions intensity and trade exposure, and then developing an approach for allocating allowances to qualifying EITEs to mitigate the identified leakage risk. The allocation of allowances to EITEs can be based upon historical emissions, often referred to as 'grandparenting', or based on a combination of historical emissions, production data and/or benchmarking using either a 'fixed-sector benchmarking' or 'output-based allocation' approach.
17. Output-based allocation approaches are the most common and considered best practice because they target leakage risk more robustly by adjusting allowances to EITEs annually based on actual production. This approach is also considered most effective when paired with sector-level benchmarking that rewards more efficient production within the jurisdiction. Some jurisdictions, such as California, also provide financial support to EITEs for electricity purchased from utilities to help mitigate leakage risk.
18. One of the main challenges around free allocation to EITEs is that it can diminish abatement incentives by shielding these industries from the full impacts of the carbon price. In addition, the goal of EITE allocation approaches (i.e. to reduce leakage) may come into conflict with other policy objectives for carbon pricing programs, in particular the need to reduce program caps (and allowance supply) in line with jurisdictional emissions targets.

19. To address this issue many jurisdictions, such as the European Union (EU)[3], California, Québec, and New Zealand, have been applying adjustments or 'discount factors' to EITE allowance allocation in order to progressively reduce the number of free allowances over time.
20. The two most common types of discount factors are 'assistance factors', which can differentiate the level of free allocation based on carbon leakage risk, and 'cap adjustment factors', which reduce the level of free allocation to reflect declining emission caps. Some jurisdictions, including Washington, apply discount factors based on anticipated efficiency improvements by EITEs over time (see Document 2 for more details).
21. When comparing Washington's EITE allowance allocation approach to other jurisdictions with similar carbon pricing programs (See Table 1 in detailed findings section), a number of differences can be identified. These include:
    a) Washington does not have a designated approach for assessing leakage risk for existing industrial activities in the state, which may make it difficult to ensure leakage mitigation policies are targeted effectively or to monitor changes to leakage risk over time.
    b) The CCA does not require any consideration of leakage risk associated with the impacts of carbon pricing on electricity purchased by EITEs, which may result in unmitigated leakage risk especially if electricity use by EITEs substantially increases.
    c) Washington does not apply any sector-level benchmarking as part of its output-based allocation method, which may affect incentives for investment in efficient production within the state, particularly in the case of new EITE facilities.
    d) Washington is the only jurisdiction that has yet to implement a cap adjustment factor to EITE allowance allocation to help ensure total allocation aligns with the program cap.
22. These differences suggest that Washington's current EITE allowance allocation approach policies may not include all aspects of 'best practice policies' for avoiding leakage and maintaining competitiveness of EITEs in carbon pricing programs. It also highlights that Washington is missing at least one critical component from its EITE policy design, being the absence of a cap adjustment factor or equivalent mechanism to ensure total no-cost allowance allocation remains under annual budgets and program cap.
23. These issues will need to be considered in the design of EITE allowance allocation for 2035-2050 to ensure that leakage risk is being mitigated effectively and that total no cost allocation for all eligible entities (EITEs and electric and natural gas utilities) remains within annual allowance budgets, the program cap, and other program requirements as specified in statute.
24. While not addressed in this document, the potential economic and environmental justice impacts of leakage and EITE allocation policies are important aspects that must also be considered in the design of EITE allocation approaches within carbon pricing programs.

[3] The EU will be phasing out free allowances altogether from 2026-2034 and replacing it with the carbon border adjustment mechanism.

Section 3: Detailed findings and supporting information

Emissions leakage theory

26. Most jurisdictions that have implemented carbon pricing policies to date have included policies designed to mitigate leakage and maintain the competitiveness of EITEs.[4]
27. The primary rationale for this approach includes that:
    a) EITEs have high energy requirements and high greenhouse emissions and are therefore likely to face high compliance costs under carbon pricing programs while also facing significant technical and financial challenges in decarbonizing certain emission-intensive operations and processes.
    b) EITEs compete in international markets and face competition from manufacturers located in jurisdictions without carbon pricing policies or other direct controls on emissions, and if EITEs reduce production in one jurisdiction due to carbon pricing policies it is likely to cause a corresponding increase in production and higher greenhouse gas emissions elsewhere[5], resulting in emissions 'leakage'.
28. Even among jurisdictions that have implemented, or are moving towards, carbon pricing there is variation among emission reduction targets and the design of carbon pricing policies. For example, some jurisdictions have relatively ambitious climate targets and longstanding carbon pricing programs, such as the EU and California. While other jurisdictions are at earlier stages of planning or implementing carbon pricing, such as Canada, Brazil, China and South Korea, as well as the States of New York and Oregon. Some jurisdictions are pursuing hybrid approaches that combine elements of carbon pricing with direct emissions controls, such as the Greenhouse Gas Emissions and Energy Management for Manufacturing rules in Colorado.
29. This variation in carbon pricing (or its absence) can give rise to differences in compliance costs for the same industry in different locations thus affecting competitiveness. This is particularly relevant if facilities compete strongly with facilities in non-regulated jurisdictions and have no cheaply available emissions reduction options.
30. The economic theory is that leakage would occur when production or investment shifts from those jurisdictions with carbon pricing to more emissions-intensive facilities in jurisdictions without carbon pricing or emissions controls, leading to an increase in net global emissions.
31. In comparison, other sectors that may be subject to carbon pricing, such as electric and natural gas utilities and fuel suppliers, are not considered to face the same type of external competition. This is because they are either regulated monopolies and/or can more easily pass on compliance costs without impacting profitability or market share.

Empirical evidence

32. A review of the available literature published by the International Carbon Action Partnership (ICAP) in 2020 found that evidence of leakage was mixed. While *ex ante* policy impact analyses (i.e. modeling) often predicted emissions leakage impacts for EITEs, *ex post* policy evaluations have to date found limited empirical evidence of leakage occurring as a result of the implementation of carbon pricing policies.

[4] ICAP 2025, Emissions Trading Worldwide: Status Report 2025.
[5] Assuming there are higher life cycle emissions associated with imported products from competitors.

33. The explanation offered by ICAP for these mixed results are that:
    a) Carbon prices in most jurisdictions have been relatively low to date, which is unlikely to have had much impact on competitiveness or investment decisions for EITEs.
    b) Carbon pricing policies have protected those EITE sectors considered to be most at risk of carbon leakage with either free allocation, rebates, or exemptions, and so there are no real-world examples where EITEs faced the full carbon price.
    c) Most studies have focused on assessing short-term carbon leakage risks, whereas competitiveness issues that ultimately lead to industry relocation (and leakage) are more likely to occur over the long term.
    d) While environmental regulations can affect competitiveness, research indicates that the broader business and trade environment (such as tax rates, labor availability, and infrastructure) has a greater impact on large-scale competitiveness in the long term.
34. When considering leakage risk under Washington's Cap-and-Invest Program, an important distinction is the fact that it is a sub-national carbon pricing mechanism. In this context, assessing leakage risk is considered more challenging because:
    a) EITEs often compete with facilities located in other states as well as internationally.
    b) Official international trade data published by the U.S Census Bureau does not isolate exports produced in Washington (or imports destined for Washington) from the trade flows moving through Washington.
    c) There is no official data source for tracking imports and exports between U.S. States.[6]
35. The California Air Resources Board commissioned multiple studies in 2016 that investigated both inter-state leakage and international leakage risk associated with California's Cap and Trade Program.[7] Those three studies employed different modeling approaches to assess leakage risk for EITEs on California and found that some industrial activities would face higher leakage risk than others. However, it is unlikely that the findings of those California studies can be extrapolated to Washington given the different composition of EITE Industries in California compared to Washington and other competitiveness factors that may be unique to Washington.
36. Another important reason for the lack of empirical evidence of emissions leakage may be the fact that environmental compliance costs are only one factor in the multidimensional production decisions made by EITEs. As found by Vivid Economics in its report on sector competitiveness under proposed carbon pricing in Oregon:

> *"Purchasing emission permits or paying a carbon tax is only one part of the cost function [for EITEs] and other factors such as resource prices or labor costs are often more significant. In addition, facilities have long been observed to compete not only on costs, but also on the efficiency of converting inputs into high-value outputs. In this process, factors such as access to a qualified labor force, stable institutions, and innovation and technological development are often more important than mere cost competition, and are crucial to Oregon's state competitiveness. These findings are in*

[6] The best available public dataset, the US Census Bureau's Commodity Flow Survey, is only published every 5 years and does not disaggregate beyond the NAICS 3-digit level in the current published version (2017).
[7] Hamilton et al. 2016, Gray et al. 2016, Fowlie et al 2016.

line with a longstanding and large body of research on the effects of environmental policies and the optimal location of production."[8]

37. These wider factors that can affect the competitiveness of EITEs were described in a report on manufacturing competitiveness in Washington published by the Association of Washington Business in 2021.[9] This report found that the factors affecting competitiveness of manufacturing facilities in Washington included taxes and fiscal policy (e.g. overall tax obligations), labor and innovation (e.g. talent availability and investment in research and development), energy and land costs, infrastructure, and regulatory costs and certainty.
38. In conclusion, while the empirical evidence of leakage may be mixed, leakage risk remains an important consideration in the design and implementation of carbon pricing programs to ensure that they are supporting net global reductions in greenhouse emissions and not simply resulting in the displacement of production and emissions to other jurisdictions. The impact of carbon pricing also needs to be considered alongside other factors affecting the short- and long-term competitiveness of EITEs, which are likely to vary across jurisdictions and between different sectors.

Identifying and assessing leakage risk

39. There are two key factors that influence whether an industrial or manufacturing sector is considered EITE and thus at risk of emissions leakage:
    a) **Carbon cost exposure or 'emissions-intensity'** – which refers to the level of impact that carbon pricing has on a facility or sector based on anticipated compliance costs.
    b) **Cost pass-through capacity or 'trade exposure'** – which refers to the ability of a facility or sector to pass through compliance costs without significant loss of market share to competitors from other jurisdictions.
40. The most common approach for identifying and assessing sectors exposed to carbon leakage risk involves the use of emissions intensity and trade exposure metrics as follows:

$$\textbf{Emissions Intensity} = \frac{\text{Emissions (tons of } CO^2\text{e)}}{\text{Value-added or Revenue (\$)}}$$

$$\textbf{Trade Exposure} = \frac{\text{Imports + Exports}}{\text{Domestic Production + Imports}}$$

41. In these metrics, the 'emissions intensity' metric is designed to capture the direct and indirect costs of carbon pricing and is measured by volume of emissions per unit of output, revenue, value-added, or profit. The 'Trade exposure' metric aims to capture the capacity of a regulated firm to pass through the costs of carbon pricing (without losing market share) and is often measured by the total volume of imports and exports of a product relative to imports and domestic production.
42. In some jurisdictions, notably the EU, the emissions intensity metric also incorporates the indirect emissions associated with purchased electricity.
43. Alongside these two metrics, some jurisdictions use additional criteria or methods to assess leakage risk. For example, the EU Emissions Trading System (ETS) uses qualitative assessments

[8] Vivid Economics 2018, Oregon Sectoral Competitiveness under Carbon Pricing.
[9] Association of Washington Business 2021, Manufacturing Competitiveness Study.

to identify 'borderline' EITE sectors, which focus on market characteristics, profitability and emissions reduction opportunities (including the extent of the adoption of best available technologies).

44. In general, jurisdictions often identify similar sectors as being at risk of emissions leakage. For example, in California, the EU, and Québec, sectors such as pulp and paper, chemicals, cement, aluminum, and steel have been identified as at risk of carbon leakage from their respective carbon pricing programs. Some jurisdictions, such as California, Québec, and New Zealand have determined that some sectors faced higher levels of leakage risk than others and have either proposed or adopted tiered approaches to leakage risk mitigation on this basis.

Policies for avoiding emissions leakage under carbon pricing

45. Within the context of carbon pricing programs, there are two primary policies that have been adopted by jurisdictions to mitigate carbon leakage and maintain the competitiveness of EITEs:
    a) The allocation of free or 'no-cost' allowances to industries deemed emissions intensive and trade exposed, which are sometimes accompanied by credits for purchased electricity (that is subject to carbon pricing).
    b) The establishment of Carbon Border Adjustment Mechanisms, which impose a carbon price on imports of energy or emissions intensive products from countries with less stringent climate policies.
46. Other policies that have been proposed to address leakage include:
    a) Incentivizing the procurement of products manufactured consistent with more stringent environmental regulations (e.g. carbon pricing), such as Buy Clean, Buy Fair policies.
    b) Targeted investments in clean technologies, such as using revenues from carbon pricing program to help EITEs decarbonize and overcome competitiveness issues.
    c) Consumption charges that aim to restore price signals on the use of emissions-intensive goods, whether imported or domestically produced.
    d) Subsidies or rebates linked to in-state production and number of high-quality jobs.
47. The most common policy to address leakage risk for EITEs is free allowance allocation.[10] While a Carbon Border Adjustment Mechanism is being implemented in the EU and has been the subject of legislative proposals in the U.S. Senate, this policy mechanism would face significant legal and implementation challenges for subnational carbon markets like the Cap-and-Invest Program in Washington. While some novel approaches for overcoming these challenges have been proposed, such as setting state sales tax based on a product's carbon intensity[11], these approaches have not been adopted by other U.S States or appraised in detail.
48. For this reason, free allowance allocation approaches were the focus of this review of best practice policies for avoiding emissions leakage. However, sub-national jurisdictions like Washington may need to re-evaluate their leakage mitigation policies if carbon border adjustment mechanisms become more common.

[10] ICAP 2025, Emissions Trading Worldwide: Status Report 2025.
[11] As proposed by Jeffrey Rissman in his presentation to the EITE advisory group on Nov. 14, 2024.

The allocation of free or 'no cost' allowances to EITEs

49. Establishing leakage mitigation policies within carbon pricing programs involves two key aspects:
    a) Identifying which sectors and facilities are exposed to leakage risk.
    b) Designing and implementing an approach for allocating allowances to applicable industries/facilities to mitigate the identified leakage risk.

Identifying sectors exposed to leakage risk

50. As noted above, the most common approach for identifying sectors exposed to carbon leakage risk involves using two metrics to determine the 'emissions intensity' and 'trade exposure' of domestic facilities and sectors that would be subject to carbon pricing. These metrics are then used to determine the extent to which sectors are 'emissions-intensive' and 'trade exposed', which may involve ranking industries or applying thresholds based on these metrics.
51. For example, the California Air Resources Board integrated the 'emissions-intensity' and 'trade-exposure' metrics into a framework that was used to rank industrial sectors as either high, medium or low leakage risk[12], which was used as the basis for determining eligibility for free allocation and levels of assistance.[13] A similar approach was adopted in Québec.[14]
52. When establishing the Cap-and-Invest Program in Washington, the Legislature classified certain industrial activities as emissions-intensive and trade-exposed directly in statute based upon the North American Industry Classification System (NAICS) codes used by federal statistical agencies. This did not involve the use of any specified metrics. The legislature did however require Ecology to establish a criteria and protocol to enable manufacturing activities not directly listed in the CCA to petition Ecology to be classified as EITE and thus be eligible for no-cost allowances. This was codified through rule as WAC 173-446A and involves the use of a conventional trade exposure metric and a mass-based emissions-intensity metric to determine whether a facility should be deemed EITE, along with consideration of air pollution impacts.
53. In its review of leakage policies in 2020[15], ICAP concluded that while the conventional 'emissions-intensity' and 'trade-exposure' metrics remain the most pragmatic way to identify sectors exposed to leakage risk, more nuanced approaches may be required as carbon pricing programs evolve to reflect net-zero emission targets. In addition, the 2024 Annual Report of the Independent Emissions Market Advisory Committee in California suggested that policymakers in California should "consider additional changes to the formulas used to award free allowances to trade-exposed industries to more closely reflect the risk of leakage on an industry-specific basis, or by prioritizing allocations for industries that are anticipated to maintain substantial activities in a decarbonized future activities in a decarbonized future."[16] These are factors that may need to be considered in the design of Washington's EITE allowance allocation approach for 2035-2050.

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[12] CARB, 2010 Leakage Analysis (2010 Regulation, Appendix K to the Initial Statement of Reasons)
[13] The original intention was to apply different levels of assistance based on leakage risk, but the California legislature mandated that assistance levels were fixed at 100% for all sectors.
[14] Ministère de l'Environnement (Québec), Emissions-Intensive Trade-Exposed (EITE) Companies.
[15] ICAP 2020, Carbon Leakage and Deep Decarbonization: Future-proofing Carbon Leakage Protection.
[16] 2024 Annual Report of the Independent Emissions Market Advisory Committee.

Designing and implementing an approach for allocating allowances

54. The design of free allocation approaches for EITEs in carbon pricing programs have generally consisted of three general approaches:
    a) 'Grandparenting', whereby allowances are allocated based upon historical emissions from a facility in a specified timeframe.
    b) 'Fixed-sector benchmarking', whereby allowances are allocated based on historical production levels and an efficiency benchmark.
    c) 'Output-based allocation', whereby allowances are allocated based on actual facility-level production each year using an emissions intensity benchmark or baseline.
55. An assessment of these three approaches was conducted by ICAP in its review of leakage policies in 2020.[17] ICAP found that the grandparenting approach to EITE allocation is generally the easiest to implement because it only requires data on historical emissions. However, it has a number of downsides, most notably the risk of overcompensating EITEs during periods of lower production. In contrast, benchmarking approaches are more complicated because they require detailed production and historical emissions data at the industry or facility level to develop benchmarks or baselines. However, benchmarking approaches offer the advantage of removing the link between an individual firm's historical emissions and the allowances they receive, thus providing more incentives for abatement and rewarding efficiency improvements.
56. ICAP determined that output-based allocation approaches are best practice because they target leakage more robustly through adjustment of allowances based on current output levels. This means that when a facility produces an extra unit of output it directly results in the allocation of additional allowances, whereas this is not the case under grandfathering or fixed sector benchmarking approaches. Output-based allocation can be considered as a production subsidy for facilities in the jurisdiction to help them remain competitive. It is also considered most effective when paired with benchmarking to reward the most efficient facilities.

57. Benchmarking involves determining allocation with reference to product- or sector-level benchmarks rather than by reference to historical emissions intensities at the individual facility level. The role benchmarking in EITE allowance allocation is elaborated in Document 2: Review of alternative methods for developing greenhouse gas benchmarks for EITE facilities.

58. Alongside free allowance allocations, some jurisdictions have sought to mitigate leakage by providing financial support to EITEs for electricity purchased from utilities that are subject to carbon pricing. For example, the California Industry Assistance Credit compensates EITEs for a portion of the compliance costs associated with purchased electricity and is also intended to reward businesses that have taken early action to reduce their energy use.[18]

Issues and challenges with free allowance allocation

59. One of the main concerns around free allocation to EITEs is that it can diminish abatement incentives by shielding these industries from the full impacts of carbon price. Output-based allocation policies are considered to partially overcome this issue by rewarding companies that maintain or increase their production within the jurisdiction while also reducing their carbon

[17] ICAP 2020, Carbon Leakage and Deep Decarbonization: Future-proofing Carbon Leakage Protection.
[18] California Public Utilities Commission, California Industry Assistance Credit

intensity. This is based on the assumption that EITEs can sell surplus allowances to cover the costs of investments in emission reduction projects (as opposed to passing on those costs through higher prices).

60. As noted by ICAP, for this policy goal to be achieved "…firms must trust that they will continue to receive free allowances long after the investment has been made…[and] the credibility of such an approach therefore relies on the stability of regulatory arrangements around the provisions of free allocation as well as technology developments and the demand for allowances from other sectors."[19] However, this policy goal may come into conflict with other policy objectives and design considerations for carbon pricing programs – i.e. to reduce program caps in line with jurisdictional and global emissions targets.
61. To address this issue many jurisdictions, such as the EU[20], California, Québec and New Zealand, have been applying adjustments or 'discount factors' to EITE allowance allocation in order to progressively reduce the number of free allowances over time.

Discount factors

62. There are two common types of discount factors that are applied to EITE allowance allocation:

    a) 'Assistance factors', which can differentiate the level of free allocation for specific sectors or facilities based on carbon leakage risk to ensure allowances are allocated to those industrial activities most at risk of leakage.
    b) 'Cap adjustment factors', which reduce the level of free allocation to reflect declining emissions budgets or caps and ensure total free allowance allocation remains aligned with overarching program goals.

63. Some jurisdictions also apply other discount factors (or update benchmark values) to account for anticipated efficiency improvements and technological progress. For example, the 'reduction schedule' applied to EITE allowance allocation in Washington can be categorized as representing anticipated efficiency improvements and therefore falls under this other type 'discount factor'.

64. Table 1 below sets out the discount factors used in different jurisdictions. It is important to note that these discount factors also interact with benchmarks and/or allocation baselines that are used to calculate output-based allocation for EITEs. The role of benchmarking is discussed further in Document 2 (Review of alternative methods for developing greenhouse gas benchmarks for EITE facilities). The combined impact of discount factors and benchmarking (or allocation baselines) on total EITE allowance allocation needs to be carefully considered in the design of EITE allowance allocation policies.

Consignment

65. A variation to free allocation approaches that is becoming more common is the use of consignment auctions. Under this approach eligible entities are allocated free allowances and a portion of the allowances are 'consigned', which means they are sold at auction by the jurisdiction. The entities then receive the revenue from the sale of the consigned allowances,

[19] ICAP 2020, Carbon Leakage and Deep Decarbonization: Future-proofing Carbon Leakage Protection.
[20] The EU will be phasing out free allowances altogether from 2026-2034 and replacing it with the carbon border adjustment mechanism.

often with conditions specifying how revenue can be used. The benefits of consignment can include enhanced price discovery, increased market liquidity, and helping direct revenues towards emissions reductions or other policy objectives.[21]

66. To date this approach has been more commonly adopted for allowance allocation to utilities. For example, both Washington and California require a certain proportion of free allowances that are distributed to electric and/or natural gas utilities to be consigned to auction. However, Québec recently introduced consignment as part of an update to its EITE allocation policy whereby 1.7% of total EITE allocation is consigned to auction and revenues must be used for specified emission reduction projects.[22] This approach to EITE allowance allocation can be said to have the effect of shifting a portion of the allowance allocation from subsidizing production (for leakage mitigation) towards more directly subsidizing emissions reductions.

How Washington approach to EITE allowance allocation compares to other jurisdictions

67. Table 1 below summarizes the key design aspects of EITE allowance allocation policies in Washington compared to other jurisdictions with similar carbon pricing programs. This includes the approach for identifying industrial sectors exposed to leakage risk, policies used to address leakage risk, and the discount factors applied to EITE allowance allocation.

68. The most notable differences between Washington and other jurisdictions in Table 1 include:

    a) Washington classified sectors as EITE directly in statute rather than using conventional metrics to assess 'emissions-intensity' and 'trade-exposure' as the basis for determining sectors exposed to leakage risk. While the sectors identified in statute have generally been identified by other jurisdictions as EITE (using conventional emissions-intensity and trade-exposure metrics), the absence of a designated approach for assessing leakage risk for existing industrial activities in Washington may make it more difficult to ensure leakage mitigation policies are targeted effectively or to monitor any changes to leakage risk over time.

    b) The CCA does not include any explicit consideration of leakage risk that may occur from the impacts of carbon pricing on electricity purchases by EITEs. While electric utilities subject to the Clean Energy Transformation Act receive no cost allowances to mitigate the cost burden of the Cap-and-Invest Program for their Washington retail customers, there is no explicit requirement for utilities to consider EITE leakage risk in their use of allocated no-cost allowances. Additionally, some EITEs may not be retail customers of an electric utility receiving no-cost allowances. These circumstances may result in unmitigated leakage risk and is something that may warrant further consideration given that electricity use by EITEs may substantially increase as they seek to decarbonize their operations.

    c) Washington is the only jurisdiction that has yet to implement a cap adjustment factor (or 'phase out rate') to EITE allowance allocation. While the CCA requires allowance allocated to natural gas utilities to decline proportionally with the cap and reduces electric utility allocation in alignment with a state law that requires all electricity is free

[21] World Bank/ICAP 2021, Emissions Trading in Practice: A Handbook on Design and Implementation.
[22] Ministère de l'Environnement (Québec), Projects eligible for payment from consigned funds.

of greenhouse gas emissions by 2045, it does not authorize Ecology to apply a cap decline factor to EITE allowance allocation. This is something that will need to be considered in the design of EITE allowance allocation for 2035-2050 to ensure that total no-cost allocation for all eligible entities (i.e. EITEs and utilities) remains in line with annual allowance budgets, the program cap and other program requirements as specified in statute.

d) Washington is the only jurisdiction using output-based allocation for EITEs without applying any form of sector-level benchmarking to help determine the number of allowances received by EITEs. This may affect incentives for investment in more efficient production within the state, particularly in the case of new EITE facilities. The implications of this are elaborated in Document 2 (Review of alternative methods for developing greenhouse gas benchmarks for EITE facilities).

69. These differences suggest that Washington's current EITE allowance allocation approach policies may not include all aspects of 'best practice policies' for avoiding leakage and maintaining competitiveness of EITEs in carbon pricing programs. It also highlights that Washington is missing at least one critical component from its EITE policy design, being the absence of a cap adjustment factor or equivalent mechanisms to ensure total no-cost allowance allocation remains under annual budgets and program cap.
70. However, when making direct comparisons between EITE allocation policies across different jurisdictions, it is important to recognize that other factors may affect the relative stringency of a jurisdiction's carbon pricing program and leakage risk. This includes, for example, the trajectory of emissions reductions required under program caps and annual allowance budgets, which affects the supply and demand for allowances, and the flexibility around compliance options for covered entities, such as rules for the use of offsets and/or banking of allowances. It is also important to consider the overall level of leakage mitigation (i.e. free allowance allocation) as well as other leakage mitigation measures, provided to EITEs by each jurisdiction.
71. The issues identified above will need to be considered in the design of EITE allowance allocation for 2035-2050 to ensure that leakage risk is being mitigated effectively and that total no-cost allocation for all eligible entities (EITEs and utilities) remains in line with annual allowance budgets, the program cap, and other program requirements as specified in statute.
72. While not addressed in this document, the potential economic and environmental justice impacts of leakage and EITE allocation policies are important aspects that must also be considered in the design of EITE allocation approaches within carbon pricing programs.
73. Lastly, free allowance allocation will by statute remain the principal policy for mitigating carbon leakage in carbon pricing programs like Washington for the time being. However, states like Washington with sub-national carbon pricing programs may need to re-evaluate their leakage mitigation policies if national carbon border adjustment mechanisms become more common.

Table 1 - key design aspects of EITE allowance allocation policies in selected jurisdictions

Jurisdiction	Approach for identifying industrial sectors exposed to leakage risk	Policies used to address leakage risk	Discount factors applied
Washington	Sectors identified in statute based on NAICS codes. Sectors not identified in statute can petition Ecology to be classified as EITE based on criteria whereby 'emissions intensive' = annual emissions >25,000 MT and 'trade exposed' = TE of >15%.	Output-based allocation (with facility-specific baselines).	**'Reduction schedule'** fixed at 100% for 2023-2026, 97% for 2027-2030, and 94% for 2031-34 (equivalent to an ~0.47% year on year reduction from 2023-2034). Defaults to 94% from 2035-2050 unless changed by Legislature before December 2027. No cap adjustment factor or other discount factors applied.
California	Two methods used to determine leakage risk classification for industrial sectors: emissions intensity (EI) and trade exposure (TE). Sectors classified as high, med or low leakage risk.	Output-based allocation (with sector-level product-based benchmarks). + Electricity credits (output-based) for purchased electricity (currently limited to EITEs served by IOUs).	**Assistance factor:** fixed at 100% through to 2030 (was initially meant to be differentiated based on high/med/low leakage risk). **Cap adjustment factor** declines approx. 4% annually in proportion to the overall cap through to 2031. Certain EITEs (with high process emissions) subject to more moderate cap adjustment factor.
Québec	Two methods used to determine leakage risk classification for industrial sectors: emissions intensity (EI) and trade exposure (TE). Sectors classified as high, med or low leakage risk.	Output-based allocation (with product-based benchmarks: both sector-level and facility-specific). From 2024, 1.7% of total allocation consigned to auction and revenues must be used for emission reduction projects by EITEs.	For total allocation (including consigned allowances): **Assistance factor** specified between 90%-100% based on leakage risk during 2023-2030, plus a 1% annual reduction applied as 'minimal expected effort'. For direct allocation (excluding consigned allowances): **Assistance factor** (90-100%) and **cap decline factor** (2.34% annually), plus other discount factors specific to each facility (average annual reduction for all discount factors combined is 2.7% annually).

New Zealand	Two methods: emissions intensity (EI) and trade exposure (qualitative - based on trans-oceanic trade of products). Sectors classified as highly or moderately exposed to leakage risk.	Output-based allocation (with sector-level product-based benchmarks).	**Assistance factor**: 90% for highly emissions intensive industrial activities and 60% for moderately emissions intensive activities. **Cap adjustment factor** ('phase-out rate'): 1% annual reduction for 2021-2030 2% annual reduction for 2031–2040 3% annual reduction for 2041–2050
EU (Phase 4 – 2021-30)	Two methods: emissions intensity (incl. indirect electricity emissions) and trade exposure (TE). Binary approach for classifying sectors as exposed to leakage risk.	Fixed sector benchmark (with sector-level product-based benchmarks). Compensation provided to EITEs by some EU members states for purchased electricity ('indirect cost compensation') From 2026-2034 industrial allocation will be phased out as the Carbon Border Adjustment Mechanism is phased in.	**Assistance factor** of 100% for all industrial activities above the threshold of leakage risk (regardless of their degree of emissions intensity and trade exposure). **Cap adjustment factor** ('cross-sectoral correction factor'): 2.2% reduction annually in Phase 4.

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