


Closing the Transition Capex Gap



A Structuring Guide for Finance, Technology, Sustainability, and Innovation Leaders in Mid-Sized Industrial Companies Across Europe.

The 90-Day Blueprint
For cross-functional
leaders.

EUR 20–200M
Typical transition
program scale.

30–50%
Eligible transition
capex covered.

Executive Summary

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In a board meeting in early 2026, a European industrial CFO was asked the same question for the third time this year: how is the company going to fund its transition capex? The honest answer explains why most peers stalled. Retained earnings can't absorb it. Bank debt will not price it. Private equity will not wait for it.

The companies that are not stalled have learned to read a different funding architecture.

For mid-sized industrial companies across Europe, in chemicals, steel, cement, building materials, and advanced manufacturing, the sustainability transition has stopped being a planning question and become an operational one. The Carbon Border Adjustment Mechanism is fully in effect. The Packaging and Packaging Waste Regulation begins enforcing recycled-content quotas in August 2026. Tier 1 customers are pushing Scope 3 requirements upstream faster than regulators are imposing them. The transition is happening on the company's balance sheet, not in the next strategy cycle.

A credible transition programme typically requires EUR 20 to 200 million in capex over five to seven years. The European public funding architecture, three layers (European, national, regional) combined with four instrument types, has been designed to close the gap between what conventional finance can provide and what the transition actually costs. On a well-structured project, the stack contributes 30 to 50% of

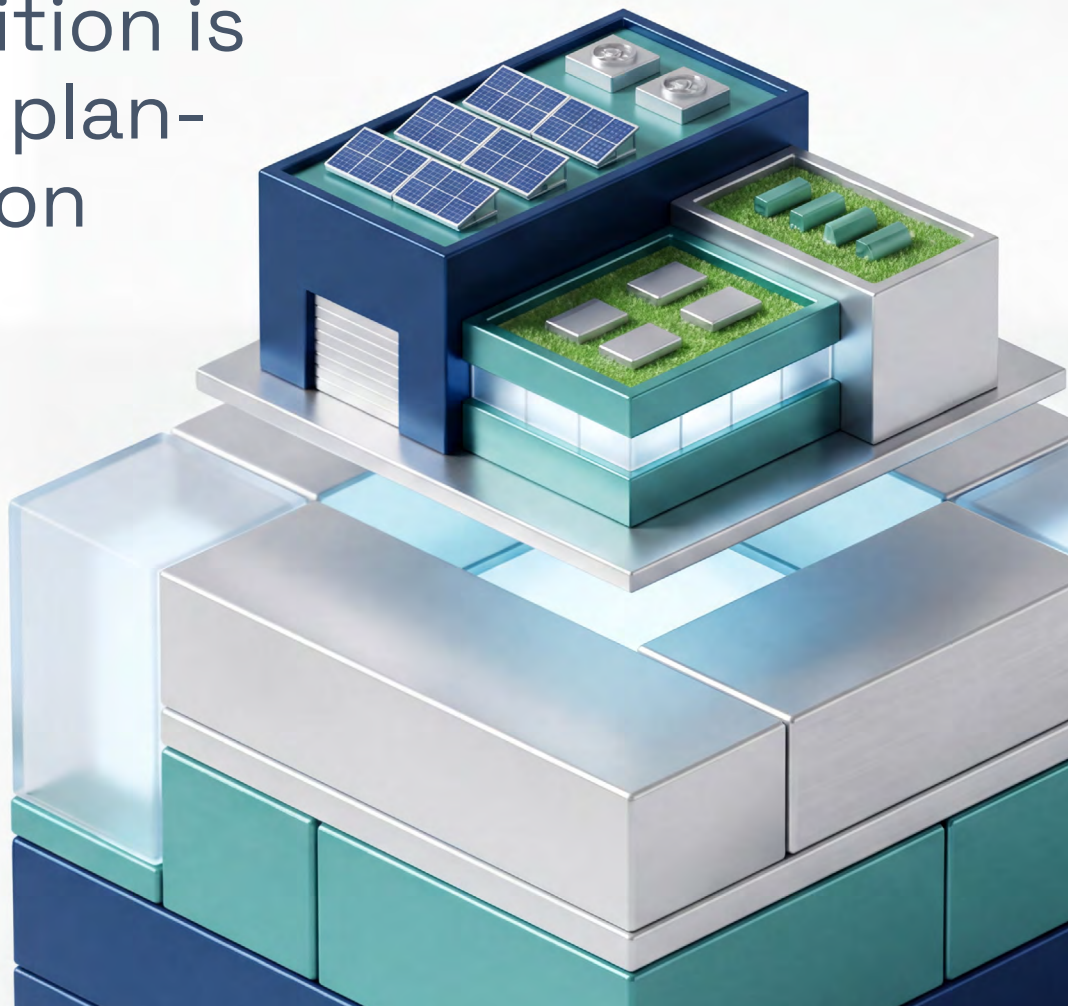
total eligible investment. Direct grants and tax credits alone cover EUR 29.3 million of a EUR 65 million reference project; add concessional debt from promotional banks and total public-leveraged capital reaches 88% of project cost.

Operators as different as Avantium in bio-based chemistry, Salzgitter in steel through its SALCOS programme, and Holcim in low-carbon cement have closed their capex stacks this way, by assembling instruments across layers rather than relying on any single source.

This paper sets out how that architecture works, illustrates the stacking logic on a concrete worked example in the Netherlands-Germany corridor, and gives each of the four functions of finance, technology, sustainability, and innovation a concrete 90-day starting point.

The companies that act in this window will access capital that others will not, against the same regulatory deadlines and the same customer requirements.

1. The transition is no longer a planning question



Four pressures are converging on the same balance sheet simultaneously. Each can be managed in isolation. Together, they redefine industrial competitiveness.

Four Converging Pressures

Energy and grid reality. Direct electrification is roughly five times more energy-efficient end-to-end than the green-hydrogen alternative, but its feasibility depends on grid capacity that does not yet exist where it is needed. A company that has the technology but not the grid connection is in much the same position as a company that has neither. The practical implication is that electrification projects must begin the grid-connection process 18 to 36 months before the technology is ready, making infrastructure planning a prerequisite, not a consequence, of transition investment.

Supply security. European recycler insolvencies have hollowed out the recycled-content supply that downstream regulation now requires. For advanced manufacturing, lithium, cobalt, rare earths, and processing capacity remain Europe's strategic vulnerability. What used to be a procurement question has become a capital question: securing supply increasingly means investing in it. Companies that invest upstream in supply security now are simultaneously building the eligibility evidence for Critical Raw Materials Act strategic project status.

Tightening regulation. Four regulatory pressures arrived in 2026 alone. CBAM placed a carbon cost on imported carbon-intensive goods from January. PPWR begins enforcing recycled-content quotas from August. Ecodesign requirements are moving into steel, aluminium, and textiles. The Corporate Sustainability Reporting Directive has turned sustainability performance into auditable data that buyers, banks, and regulators all read, and that now materially affects credit pricing. The combined effect is that the regulatory floor under industrial activity is rising at a pace that outstrips most company planning cycles.

Customer pull. For Tier 1 and Tier 2 industrial suppliers, Scope 3 requirements from OEMs, construction clients, and food and beverage customers are arriving faster than regulators are imposing them. Losing a key customer because the embedded carbon of a supplied product cannot be evidenced is a more visceral risk than any regulatory deadline. It is the risk most often cited in client conversations as the one that finally moves capex decisions through internal governance.

The Structural Funding Gap

A credible transition programme over five to seven years combines four kinds of investment: new production technology (electrified process heat, targeted hydrogen integration), new materials (bio-based feedstocks, high-quality recyclates, substitutes for scarce inputs), digital optimisation (AI-driven process control and the traceability infrastructure CSRD and CBAM now require), and sustainable product design. None of this is optional, and very little of it is affordable from internal cash flow alone.

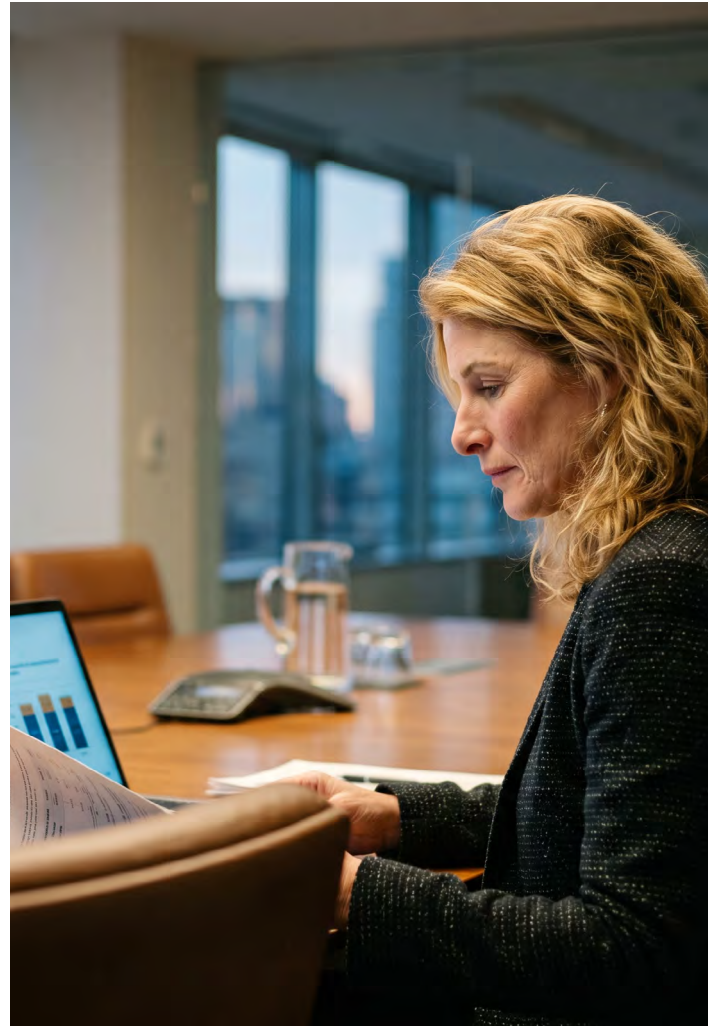
Faced with a capex programme of this size and risk profile, finance leaders default to four conventional routes, each of which works in part of the pipeline but none of which covers the whole:

- **Retained earnings** cannot absorb a first-of-a-kind unit without slowing every other investment.
- **Bank debt** struggles with first-of-a-kind technology risk; the pilot-to-deployment transition is precisely where commercial debt declines.
- **Private equity** demands 5- to 7-year exit horizons against industrial decarbonisation payback profiles of 10 to 15 years.
- **Green bonds** flow to operating wind, solar, and EV infrastructure, not to the first-of-a-kind industrial units that need the capital most.

The result is a structural funding gap between the lab and the industrial unit. The companies stuck in that gap are often heavy industries that public opinion would rather see disappear, but without which Europe cannot deliver its circular and energy transitions.

What the Reference Case Shows

Avantium's commercial plant for plant-based monomers (FDCA) in Delfzijl is the European reference point for what bridging the pilot-to-deployment gap actually looks like. Bringing the technology from lab to commercial scale required more than a decade and more than EUR 150 million, assembled from a Horizon 2020 consortium grant, Dutch national and regional support (including NOM for the northern Netherlands), a regional investment consortium, Invest-NL, EIB-backed debt through a four-bank syndicate, and downstream offtake commitments from brand owners who needed the material. The lesson is not that the technology turned out to be easier than expected. It is that the funding architecture rewarded a company that understood it, and the companies that come next will be rewarded the same way.



The Window Is Now

The European public funding architecture is shifting from pilot to deployment. Pilot evidence assembled in 2026 becomes the eligibility credential for deployment-phase capital from 2027. A company without that credential will be competing for instruments where pilot results are explicit evaluation criteria, against companies that have already done the work. Each successive cycle compounds the gap, and the gap is harder to close from behind.

2. The Public Co-Financing Stack

The architecture is often described as a list of programmes. That is the wrong mental model. What matters is how the layers and instruments combine on a single project, sequenced across the project's technology readiness journey, with each instrument doing work the others cannot.

Three Layers

The European layer sets strategic priorities and carries the largest envelopes. Horizon Europe, with EUR 95 billion budgeted for 2021 to 2027 and at least 35% earmarked for climate, finances research and innovation at TRL 4 to 7. The Innovation Fund, financed by ETS auction revenues, finances commercial demonstration at TRL 7 to 9. The Industrial Decarbonisation Bank, anchored within the Clean Industrial Deal adopted in February 2025, is intended to mobilise up to EUR 100 billion for industrial rollout, with the first EUR 1 billion pilot auction opened in October 2025 specifically for electrified and renewable process heat. The Clean Industrial State Aid Framework (CISAF), adopted in June 2025, sets the legal rules for what Member States can offer and explicitly permits cross-border stacking.

The national layer converts that capacity into operating grants, tax credits, and concessional debt, and for industrial projects in the Netherlands-Germany corridor it is where most stacks find their largest single instrument. In the Netherlands,

the anchor is typically SDE++, the operating-cost support scheme that underwrites the difference between conventional and low-carbon production costs over up to 15 years. In Germany, it is Klimaschutzverträge, the equivalent Carbon Contracts for Difference scheme, which now also covers carbon capture pathways. Around these anchors, both countries layer in instruments for R&D personnel costs (WBSO, Forschungszulage), industrial energy efficiency (VEKI, EEW), demonstration projects (DEI+, BIK), and strategic industrial investment (Klimaatfonds, Groeifondsregeling, KfW).

The regional layer is least visible but often most accessible. The European Regional Development Fund co-finances projects through regional smart specialisation strategies, and regional Landesförderbanken and development companies provide matching capital, loan guarantees, and early-stage equity. For mid-sized companies in the Netherlands-Germany corridor, the relevant institutions are:

The Public Co-Financing Stack

Three layers × four instrument types, sequenced across TRL bands

On a well-structured project, the stack contributes 30 to 50% of total eligible investment.

| | TRL 4-7 Research & early innovation | TRL 7-9 Demonstration & FOAK | TRL 9 Deployment | |
|---|--|---|--|---|
| EU level Horizon Europe, Innovation Fund, IDB | 20-50% of eligible capex (TRL 4-9) | (via national implementation) | (via national implementation) | EIB counter-guarantees |
| National level SDE++, KSV, BIK, DEI+, KfW, Invest-NL | 20-50% of eligible capex (TRL 7-9) | 10-15 year contracts closing cost premium | Up to 32-35% on R&D costs (WBSO, FZul) | Promotional bank financing (KfW, Invest-NL) |
| Regional level NRW.Bank, NBank, NOM, Oost NL, ERDF | Matching capital | - | - | Loan guarantees, early-stage equity |

Horizontal: Stacking - tax credits and concessional debt combine with whatever sits at the project's current TRL

For mid-sized companies, regional institutions are often what bridges European grant approval and project financial close.

Four Instrument Types

Capital grants reduce capex, typically by 20 to 50% of eligible investment. They are the most visible instrument but rarely the largest single contributor to a well-structured stack.

Operating grants and Carbon Contracts for Difference (CCfDs) close the cost premium between low-carbon and conventional production, typically over 10 to 15 years. In the Netherlands-Germany corridor, SDE++ and Klimaschutzverträge carry most of this work and determine whether a project's operating economics ever clear the hurdle rate. These instruments are about unit economics, not capex closure. They belong in the planning sequence earlier than most companies introduce them, because both run on fixed annual application calendars.

Tax credits improve after-tax returns and, under CISAF, stack with grants rather than competing with them. The Dutch WBSO reduces R&D personnel costs by up to 32% on the first tranche. Germany's Forschungszulage, administered by the Federal Ministry of Finance (BMF) via the Bescheinigungsstelle Forschungszulage (BSFZ) and settled through the Finanzamt as part of the tax return, not via a grant application, provides:

- 25% credit for large companies on eligible R&D personnel costs
- 35% credit for qualifying SMEs on eligible R&D personnel costs
- Assessment base: up to EUR 12 million per year
- Maximum annual credit: EUR 3.0 million (large companies) / EUR 4.2 million (SMEs)

The procedural distinction matters for CFOs: Forschungszulage runs through the tax return in parallel with grant processes, without administrative conflict.

Public guarantees and concessional debt lower the cost of capital on the share of capex that grants and credits cannot cover. EIB counter-guarantees crowd in commercial debt at preferential rates. KfW, Invest-NL, NBank, and NOM play the same role nationally and regionally, often acting as the bridge between an Innovation Fund grant and a syndicated bank facility.

The TRL Sequencing Matrix

A project presented to the wrong instrument for its technology readiness level will not be funded, regardless of technical merit.

| TRL Band | Primary Instruments | What They Fund |
|------------------|---|--|
| 4-7 | Horizon Europe | Research and early innovation Adopted 25 June 2025; permits cross-border stacking |
| 7-9 | Innovation Fund, DEI+, BIK | Commercial demonstration and first-of-a-kind units |
| 9 | Industrial Decarbonisation Bank, CCfDs (SDE++, Klimaschutzverträge) | Deployment and operating economics |
| All Bands | Tax credits (WBSO, Forschungszulage) and concessional debt (KfW, Invest-NL, NBank, EIB) | Stack horizontally with instruments above |

A pilot in 2026 funded by Horizon Europe and DEI+ or BIK becomes the eligibility credential for an Innovation Fund or BIK deployment grant in 2027 to 2028. That deployment grant in turn becomes the basis for an SDE++ or

Klimaschutzverträge contract that locks in operating economics through to 2041. The companies that read the architecture this way are not applying for grants. They are sequencing a balance sheet against a 15-year regulatory timeline.

Three Project Types with the Highest Funding Probability

1. Electrified process heat below 500°C. The technology is mature, operating economics work with an SDE++ or Klimaschutzverträge contract, and CBAM tightens the case against incumbent gas. Hydrogen integration is the targeted exception above 500°C, but with realism: at roughly 20% end-to-end efficiency, hydrogen is fundable where direct electrification is technically impossible, not merely more expensive.

2. Advanced recycling and bio-based feedstocks. PPWR demand, recycler-insolvency supply gaps, and chemical recycling and FDCA-class technologies converge on a

particularly dense funding stack for chemicals companies. This is the zone where Avantium and its peers have demonstrated that public co-financing scales with the strategic importance of the technology, not with the size of the applicant.

3. Industrial AI, digital twins, and traceability infrastructure. Compliance investment and operational efficiency converge in the same project. This category often acts as a multiplier on the other two, because it makes the evidence base for CBAM and CSRD reporting genuinely usable rather than retrofitted at the end.

3. The Stack in Practice: A Worked Example



The architecture is easier to understand on a single project than in the abstract. The case below is illustrative, sized to a project archetype Ignite Group sees frequently in client work. The numbers are realistic but not drawn from a specific named project, and a real project always differs in detail. The structuring logic and the order of magnitude of the financing stack are consistent across the projects we have seen close.

The Project

A specialty chemicals manufacturer in the Netherlands-Germany corridor produces a mid-volume polymer used in packaging and industrial applications. Two production lines run on natural gas for medium-temperature process heat at around 250°C. Three pressures are forcing action:

- CBAM is reshaping competitiveness against imports
- A Tier 1 packaging customer requires evidence of recycled content and embedded carbon by 2028
- Gas price exposure on operating costs has grown materially over the past two years

The transition plan converts both lines to electrified process heat (high-temperature heat pumps and electric resistance heating) and substitutes a portion of fossil feedstock with a bio-based alternative produced by a consortium partner.

- Total capex: EUR 65 million
- Two-thirds on electrification, one-third on feedstock substitution and digital monitoring infrastructure
- Without public co-financing: project IRR is 250 to 300 basis points below hurdle rate. The project does not get approved

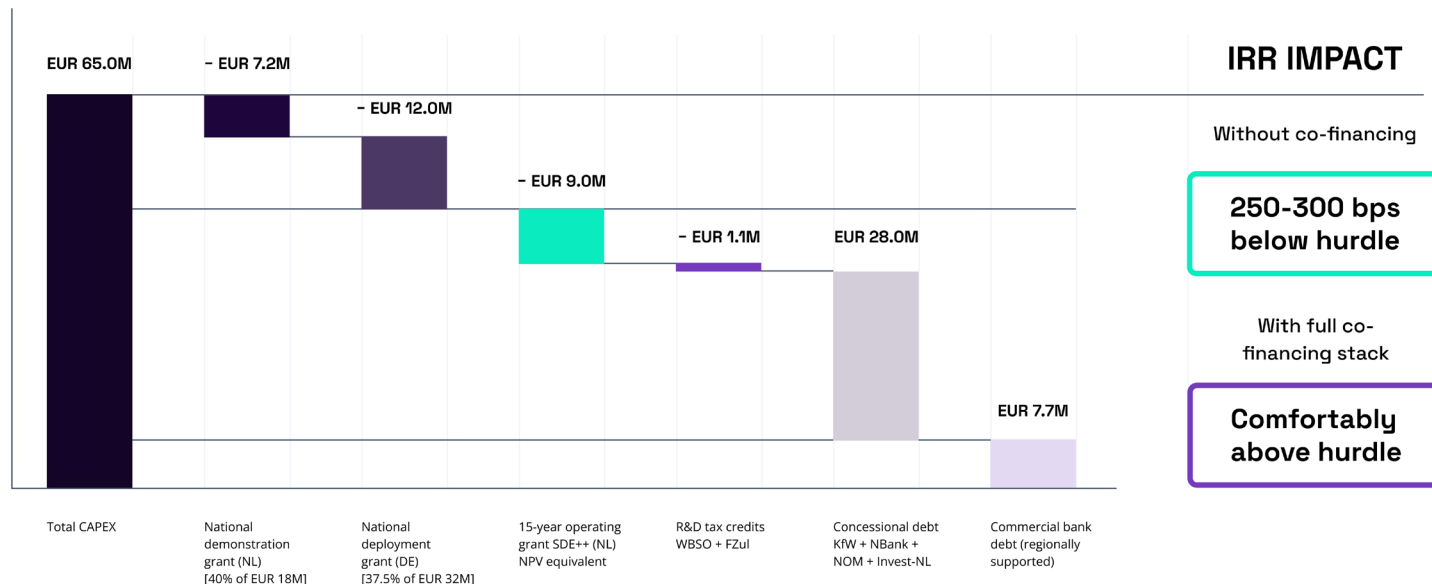
The Financing Stack

The financing builds in four steps:

Closing the EUR 65 Million Capex Stack

Total public-leveraged capital: EUR 57.3M (88%)

Direct public co-financing: EUR 29.3M (45%)



The aggregate result is more than arithmetic. Concessional debt and guarantees also lower the cost of capital on most of the remainder, and the IRR moves from below hurdle to comfortably above it. The project clears internal investment criteria not because the underlying technology has changed, but because the financing stack converts a marginal project into a commercially attractive one.

Three Structuring Decisions That Made the Difference

1. Phasing across the TRL boundary, demonstration on line one and deployment on line two, allowed each phase to draw from the right instrument and produced demonstration evidence that strengthened the deployment application. A project that attempted to go straight to deployment would have faced both an evidence gap and a more demanding set of evaluation criteria. In practice it would likely have been referred to a later auction cycle, delaying the IRR improvement by 18 to 24 months and extending gas-price exposure over that period.

2. Structuring across two jurisdictions, Dutch demonstration and German deployment, accessed both national stacks within the CISAF framework rather than being constrained by a single national envelope. CISAF was specifically designed to allow this; very few mid-sized companies currently use it that way. This decision must be made at project scoping stage, before individual applications are designed, because the jurisdictional split shapes which legal entities own which project elements. Restructuring after the fact is administratively prohibitive.

3. Building the consortium for the bio-based feedstock work, with a research institution and the downstream packaging customer, broadened the evidence base, made the project eligible for Horizon Europe funding on that element, and built supply-chain relationships that extend beyond the project itself. Consortium-building is the slowest of the three decisions to execute: it typically requires 12 to 18 months from first contact to a credible consortium agreement.

The practical implication: **consortium scoping must begin when the TRL audit is complete, not when the application deadline is in sight.**

4. The Next 90 Days

The companies that will access deployment-phase capital in 2027 are doing the unsexy work in 2026: mapping capex against architecture, auditing TRL, scoping consortia. The companies that will not, are not. Before turning to the function-specific starting points, the structural logic that connects them:

A capex map without a TRL audit cannot identify the right instruments. A TRL audit without consortium scoping does not produce eligible Horizon Europe applications. A regulatory stack without a capex map does not connect compliance to investment.

Each function's contribution is necessary; none is sufficient. The companies that move fastest are not the ones with the largest balance sheets or the deepest technical roadmaps. They are the ones whose four functions have built a working pattern around a single transition pipeline, with public co-financing structured into the capital plan as a permanent feature.

For Finance Directors and CFOs

Map the next five-year transition capex against the funding architecture, not against the operating budget alone. The relevant question is not "what can we afford from retained earnings" but "what is the residual the company actually needs to fund once the public co-financing stack is factored in."

Most companies that have already secured co-financing have used one or two instruments where four would qualify, and the gap between what is in place and what is available is typically a **10 to 15 percentage-point uplift** on eligible investment. Building the funding architecture into the next capital plan as a structural component, rather than a project-by-project exercise, is the single change that compounds across every subsequent investment decision.

For CTOs and Heads of R&D

Conduct a TRL audit of the project pipeline, mapping the corresponding instruments against each transition. Identify which projects sit clearly inside the three convergence zones (electrified process heat, advanced recycling and bio-based feedstocks, industrial AI and traceability), which can be repositioned, and which should progress on a self-funded basis.

Begin consortium scoping for the projects that need it: Horizon Europe applications, IPCEIs, and increasingly the larger national programmes require credible consortium structures with research institutions and value-chain partners. Building those relationships takes 12 to 18 months from a standing start. This is the action with the longest lead time and the one most often left until too late.

For Innovation Managers

Translate the TRL audit output into a fundable project pipeline. This function bridges technical maturity and application strategy. It is where instrument eligibility is either secured or missed. For each project in the convergence zones, define the consortium structure that opens Horizon Europe eligibility: research institution, value-chain partner, and if applicable a cross-border dimension that enables CISAF stacking.

Define which projects have IPCEI potential. This requires an early conversation with the relevant national ministry, not an application. Use the TRL audit timeline to work backwards from application deadlines: Horizon Europe calls, Innovation Fund auction windows, and national programme deadlines each have fixed calendars, and preparation lead time for a credible consortium application is typically six to nine months.

For Innovation Managers

Build the bridge between the transition plan and the capital plan. Most mid-sized companies have a sustainability plan that the sustainability function maintains, and a capital plan that the finance function maintains, and the two often do not reconcile in detail at the project level.

Translating each transition pathway into a defined project with capex, TRL trajectory, and a funding stack is the single most valuable contribution this function can make in this window. The regulatory mapping matters too: CBAM, PPWR, Ecodesign, CSDDD, and CSRD reshape the same product and process specifications from different angles, and their interaction defines what products and operations need to look like by 2028 to 2030. That mapping strengthens the case for each project against funder evaluation criteria.

Conclusion

The 90-Day Blueprint

For cross-functional leaders.

EUR 20–200M

Typical transition program scale.

30–50%

Eligible transition capex covered.

By 2027, the deployment-phase instruments will be active and the pilot evidence requirements will be in place. Companies that prepare during this window will access capital that others will not, against the same regulatory deadlines and the same customer requirements. That is what the difference looks like when it shows up on the income statement.

The architecture is in active use today. Ignite Group works with chemicals and advanced manufacturing companies across the Netherlands-Germany corridor to structure exactly this kind of integrated

transition pipeline: mapping capex against the public funding architecture, sequencing instruments across TRL boundaries, and building the consortium structures that open Horizon Europe and national programme eligibility.

If your organisation is in this window, we would welcome a conversation. A short diagnostic conversation usually shows where your project pipeline sits in the architecture, and where the gap to a full stack lies.

About

Ignite Group is a leading European full-service funding advisory, helping innovation-driven businesses and organisations use public funding as a strategic financing tool. Our aim is to realise the maximum funding potential for every customer, with minimal internal effort and the highest level of audit assurance.

With over 25 years of experience, more than 300 funding and sector specialists, and the targeted use of AI-powered technology, we support our customers across every stage of the funding process: from identifying all qualifying opportunities and structuring projects for compliance, to audit-ready applications, documentation and reporting.

In 2025 alone, Ignite Group secured over €500 million in public funding for its customers across Europe, achieving a 95% success rate and 99% compliance across all regulatory audits. Together we ignite progress.

igniteGroup

experts in funding

Glossary

Regulatory Frameworks

| Acronym | Full Name | Note |
|---------|--|--|
| CBAM | Carbon Border Adjustment Mechanism | Fully operational from 1 January 2026 |
| CID | Clean Industrial Deal | EU industrial strategy, adopted 26 February 2025 |
| CISAF | Clean Industrial State Aid Framework | Aangenomen op 25 juni 2025; staat grensoverschrijdend stapelen toe |
| CRMA | Critical Raw Materials Act | Strategisch projectenkader: versnelde vergunningverlening + financiering |
| CSRD | Corporate Sustainability Reporting Directive | Duurzaamheidsrapportage voor grote en beursgenoteerde ondernemingen |
| CSDDD | Corporate Sustainability Due Diligence Directive | Zorgvuldigheidsverplichtingen in de waardeketen |
| ESPR | Ecodesign for Sustainable Products Regulation | Eerste werkplan: staal, aluminium, textiel |
| ETS | Emissions Trading System | Cap-and-trade; ETS2 dekt gebouwen/transport/kleine industrie vanaf 2028 |
| NZIA | Net-Zero Industry Act | Doelstelling van 40% binnenlandse EU-productie tegen 2030 |
| PPWR | Packaging and Packaging Waste Regulation | Handhaafbaar vanaf 12 augustus 2026 |

Key Concepts

CCfD (Carbon Contract for Difference)

Langlopend contract dat het verschil uitbetaalt tussen de reductiekosten van een project en de geldende koolstofprijs.

FOAK (First-Of-A-Kind)

Een industriële installatie die een technologie voor het eerst op commerciële schaal toepast

Pilot-to-deployment gap

The financing phase between successful technology pilot and commercial industrial deployment, where conventional debt cannot price residual technology risk and equity demands incompatible exit horizons.

TRL (Technology Readiness Level)

Scale from 1 to 9 indicating technology maturity, from basic principles (TRL 1) to commercial deployment (TRL 9).

EU-Level Funding Instruments

| Instrument | Description |
|---------------------------------------|--|
| Horizon Europe | EUR 95bn, 2021–2027; ≥35% climate; funds TRL 4–7 |
| Industrial Decarbonisation Bank (IDB) | Up to EUR 100bn; first auction EUR 1bn (Oct 2025) for electrified process heat |
| Innovation Fund | ETS-funded; commercial demonstration TRL 7–9 |
| InvestEU | Budget guarantees mobilising private finance |
| IPCEI | State aid for cross-border strategic industrial projects |

National Instruments: Netherlands and Germany

| Acronym | Country | Note |
|---------------------|------------|--|
| BIK | DE | Bundesförderung Industrie und Klimaschutz; large industrial decarbonisation |
| DEI+ | NL | Demonstratie Energie- en Klimaatinnovatie; TRL 7–9 pilot/demo |
| Forschungszulage | DE | BMF R&D tax credit; 25% large / 35% SME; base EUR 12M/yr; max EUR 3.0M / EUR 4.2M |
| KfW | DE | Federal promotional bank; energy efficiency and decarbonisation finance |
| Klimaatfonds | NL | National climate fund for breakthrough decarbonisation |
| Klimaschutzverträge | DE | Carbon Contracts for Difference; 15-year operating-cost support |
| NBank | DE (NDS) | Landesförderbank Lower Saxony; NL border corridor |
| NOM | NL (North) | Regional development company Groningen/Drenthe/Friesland |
| Oost NL | NL (East) | Regional development company Overijssel/Gelderland (NRW border) |
| SDE++ | NL | Stimulerend Duurzame Energieproductie; 15-year operating grant |
| VEKI | NL | Versnelde Klimaatinvesteringen Industrie; accelerated industrial climate investments |
| WBSO | NL | Wet Bevordering Speur- en Ontwikkelingswerk; R&D tax credit ≤32% first tranche |