NPVI Nationaal Programma Verduurzaming Industrie

Welkom NPVI Connect! 2025

Break-out Marktcreatie

Namen sprekers: ***Pim van Leeuwen (KGG), IJmert van Muilwijk (E-NL), Anouk van Loon (Tata), Arnold Mulder (Shell), Marnix Koopmans (Vemobin), Mark Intven (VNCI), Tessa Hermens (NVDE), Reinier Gerrits (Meststoffen NL)***

Break-out Marktcreatie

- Inleiding KGG (Pim van Leeuwen) *[5 min]*
- Verdieping: Deloitte-studie (IJmert van Muilwijk, E-NL) *[20 min]*
- Sectorperspectieven:
  - Chemie: Arnold Mulder (Shell) en Mark Intven (VNCI) *[5 min]*
  - Staal: Anouk van Loon (Tata) *[5 min]*
  - Raffinage: Marnix Koopmans (Vemobin) *[5 min]*
  - Meststoffen/kunstmest: Reinier Gerrits (Meststoffen NL) *[5 min]*
- Discussie *[15 min]*

Marktcreatie: definities, waarom, doelen KGG

- **Definities:**
  - Marktcreatie: alle mogelijke overheidsinterventies gericht op het creëren van een specifieke markt.
  - Vraagcreatie: het stimuleren van de vraag naar producten/diensten met als doel om een specifieke markt te creëren of vergroten.
  - Lead markets: markten die vooroplopen bij het adopteren nieuwe technologie/producten/diensten
- **Waarom vraagcreatie?**
  - Alleen beprijzen fossiel of stimuleren aanbod/productie vaak onvoldoende voor verduurzaming EII
  - De vraag naar duurdere groene producten blijft achter; daarmee ontbreekt een afzetmarkt
  - Stimulering van de vraag is nodig om groene investeringen echt te laten landen
- **Hoofddoelen voor KGG/VI:**
  - Eindmarkten creëren zó dat enerzijds energie-intensieve productie in NL/EU plaatsvindt en anderzijds die productie groen en circulair is:
    - Productie in NL/EU: zowel ombouw bestaande als opbouw van nieuwe groene productie
    - Groene productie: mondiale CO2-reductie
    - Circulariteit: bijdrage aan hergebruik materialen en circulaire economie

Marktcreatie: veel momentum

- **Nationaal:**
  - Tweede Kamer: diverse moties (Thijssen 20mrt– actieplan groene eindmarkten; Koekkoek 20mrt – publieke vraagstimulering bouwsector; Rooderkerk 2 okt– scopeverbreding groene marktcreatie)
  - Publiek-privaat: Demand Creation Coalition met in december 2024 aanbieding *Call for Demand Creation* aan Eurocommissaris Hoekstra; Dutch Sustainable Growth Coalition WG vraagcreatie
  - Non-paper: NL positiepaper dat EC oproept tot concrete stappen op gebied van vraagcreatie
- **Europees:**
  - Clean Industrial Deal (februari 2025)
  - Steel- and Metals Action Plan (maart 2025)
  - Carbon Border Adjustment Mechanism, herziening (juni – heden)
  - Construction Products Regulation (CPR) (herziening 2024; uitwerking vindt nu plaats)
  - Ecodesign for Sustainable Products Regulation (ESPR) (herziening 2024; uitwerking vindt nu plaats)
  - Industrial Accelator Act (IAA) (Q4 2025)
  - Herziening Public Procurement Framework (Q4 2026)
  - Circular Economy Act (Q4 2026)
  - …

Mobilizing consumer demand for sustainable investments

Potential role of demand-side policies to stimulate investments in sustainable products and strengthen European heavy industry

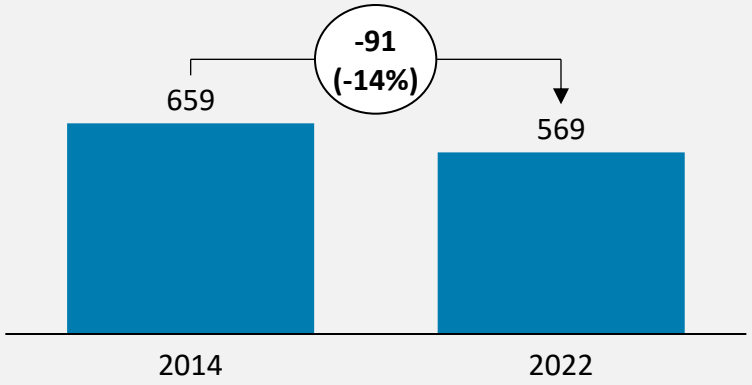
July 2025

Selected research insights

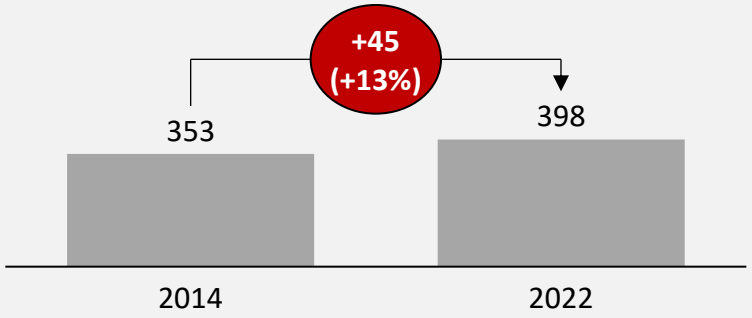
Contents

Challenges in EU heavy industry have led to low adoption of low-carbon emission solutions

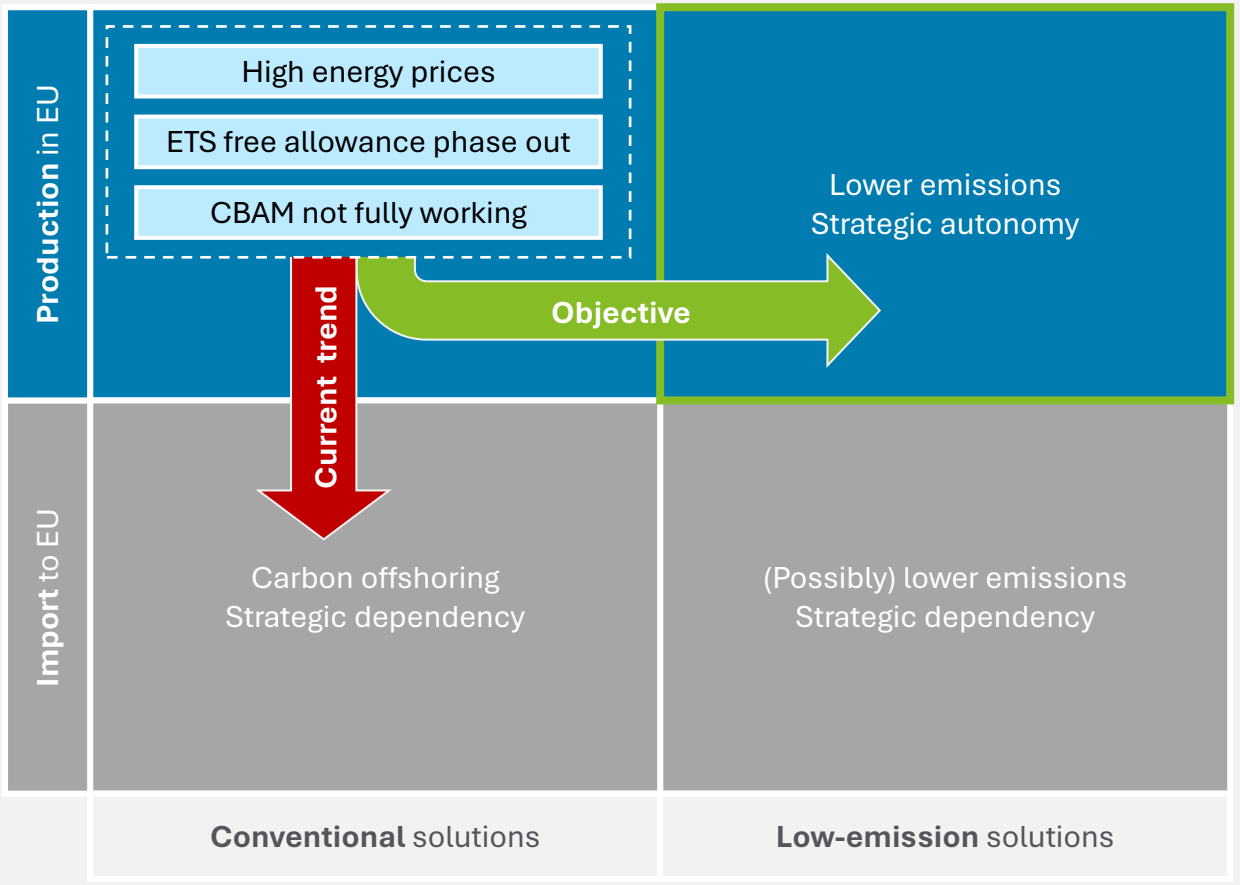
Emissions from production in EU (Mt CO_2e)



Emissions from import to EU (Mt CO_2e)

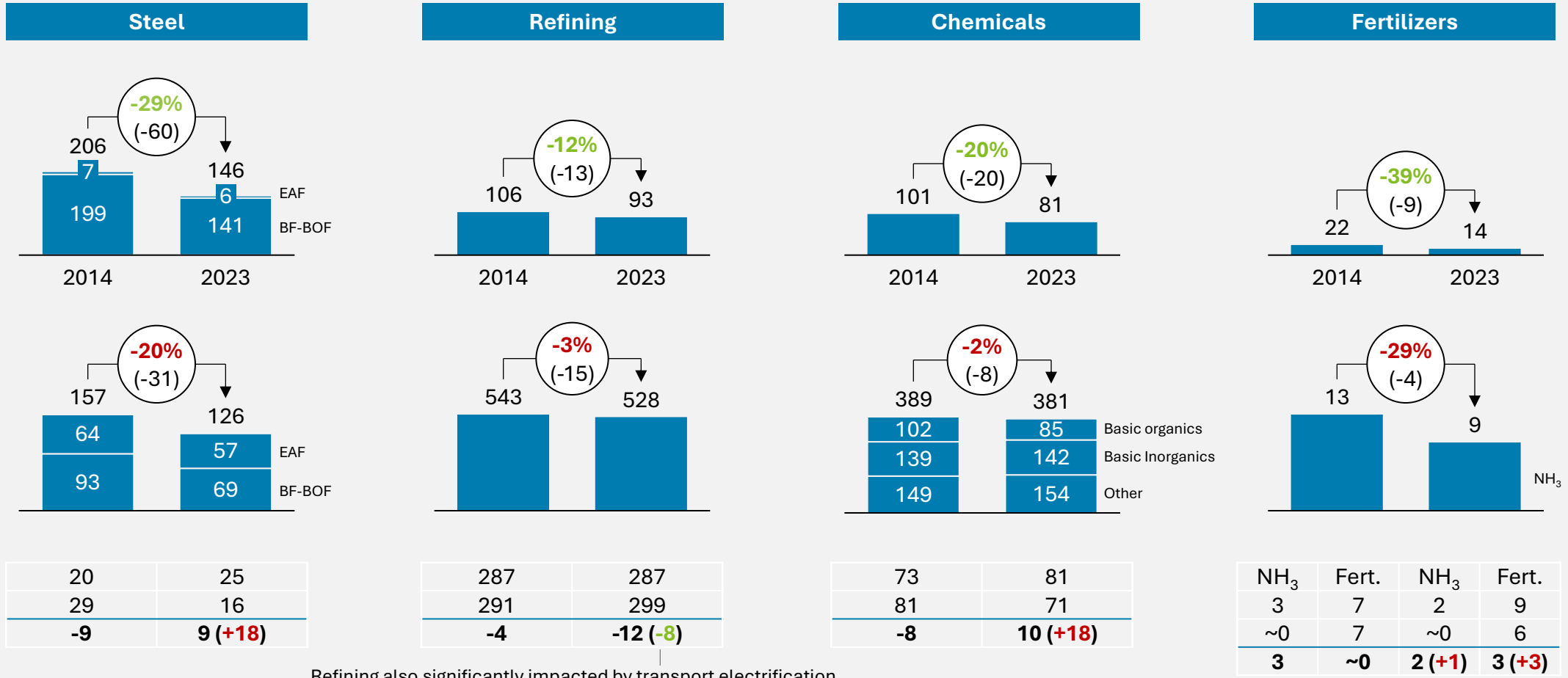


Current challenges in EU heavy industry – ILLUSTRATIVE



EU production in four sectors declined by 2%-29% in 10 years, and mostly replaced by imports

EU Scope 1 emissions, production and net import by sector (2014 – 2023)

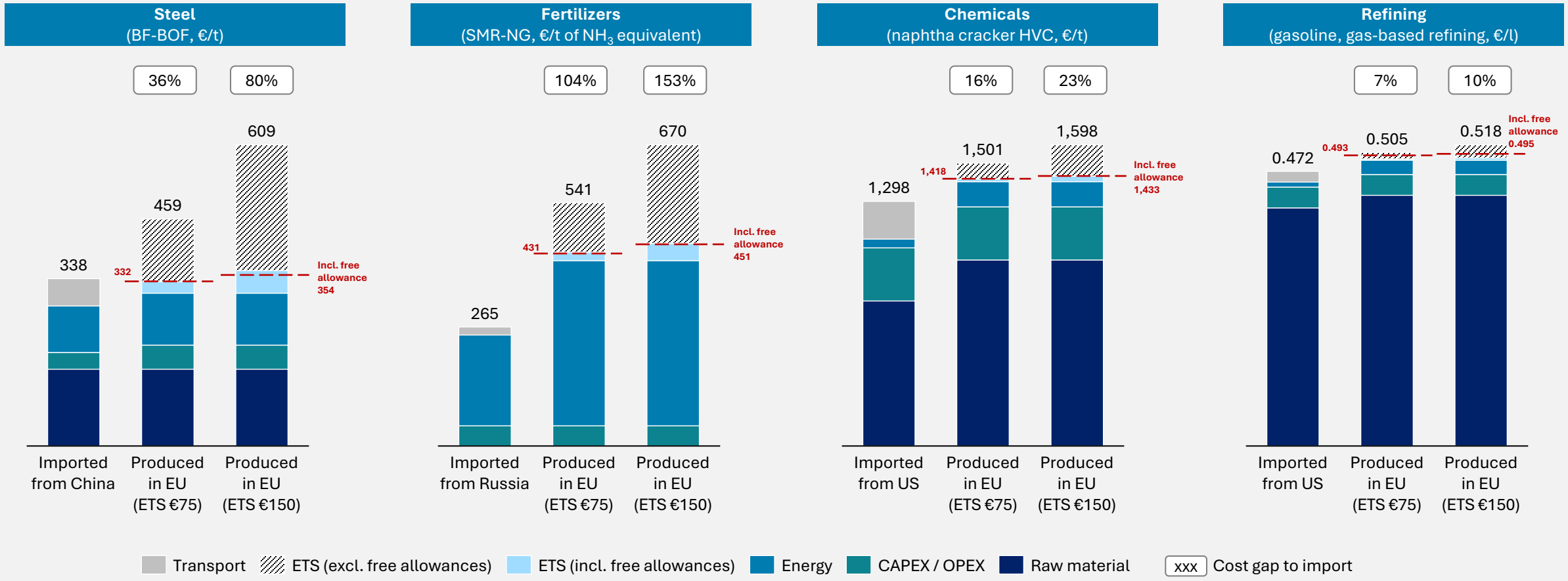


	Steel		Refining		Chemicals		Fertilizers			
Import	20	25	287	287	73	81	NH_3	Fert.	NH_3	Fert.
Export	29	16	291	299	81	71	3	7	2	9
Net import (Mt)	**-9**	**9 (+18)**	**-4**	**-12 (-8)**	**-8**	**10 (+18)**	~0	7	~0	6
							3	**~0**	**2 (+1)**	**3 (+3)**

Refining also significantly impacted by transport electrification

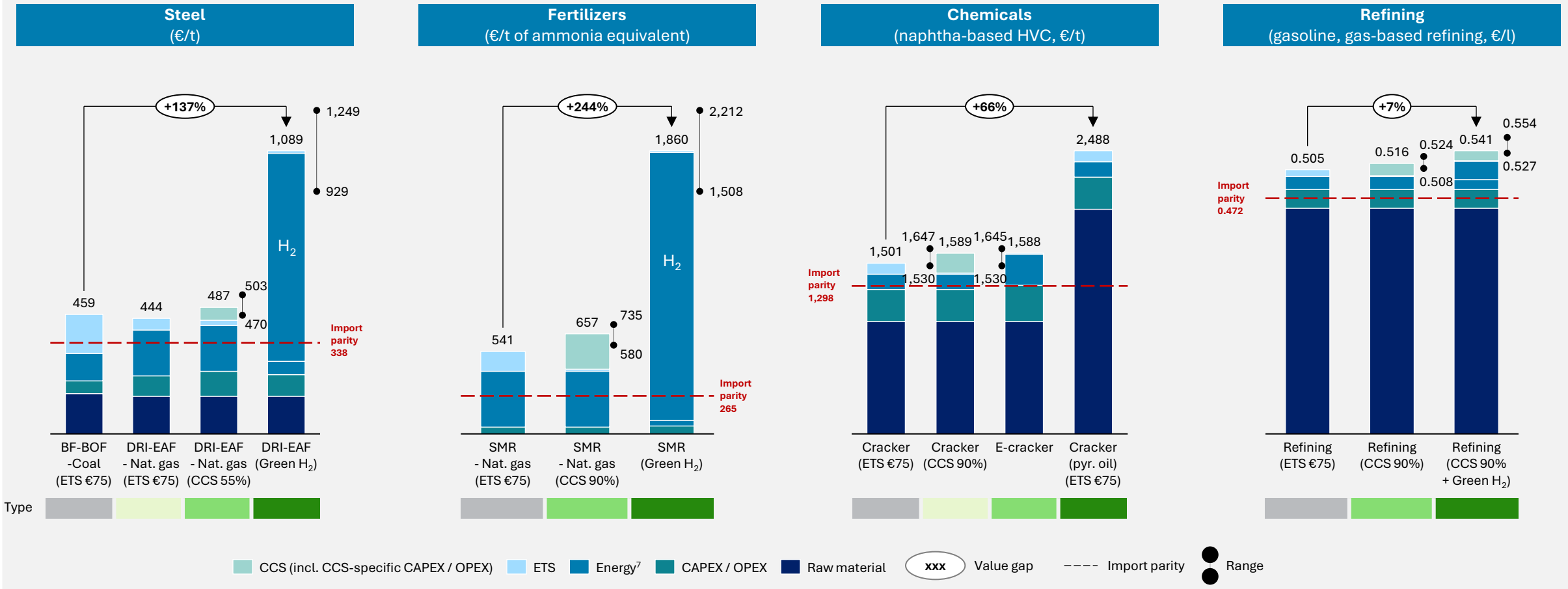
Strong incentive for import mainly due to the EU's high energy prices and (future) impact of ETS

Cost of EU production vs. import (2024)



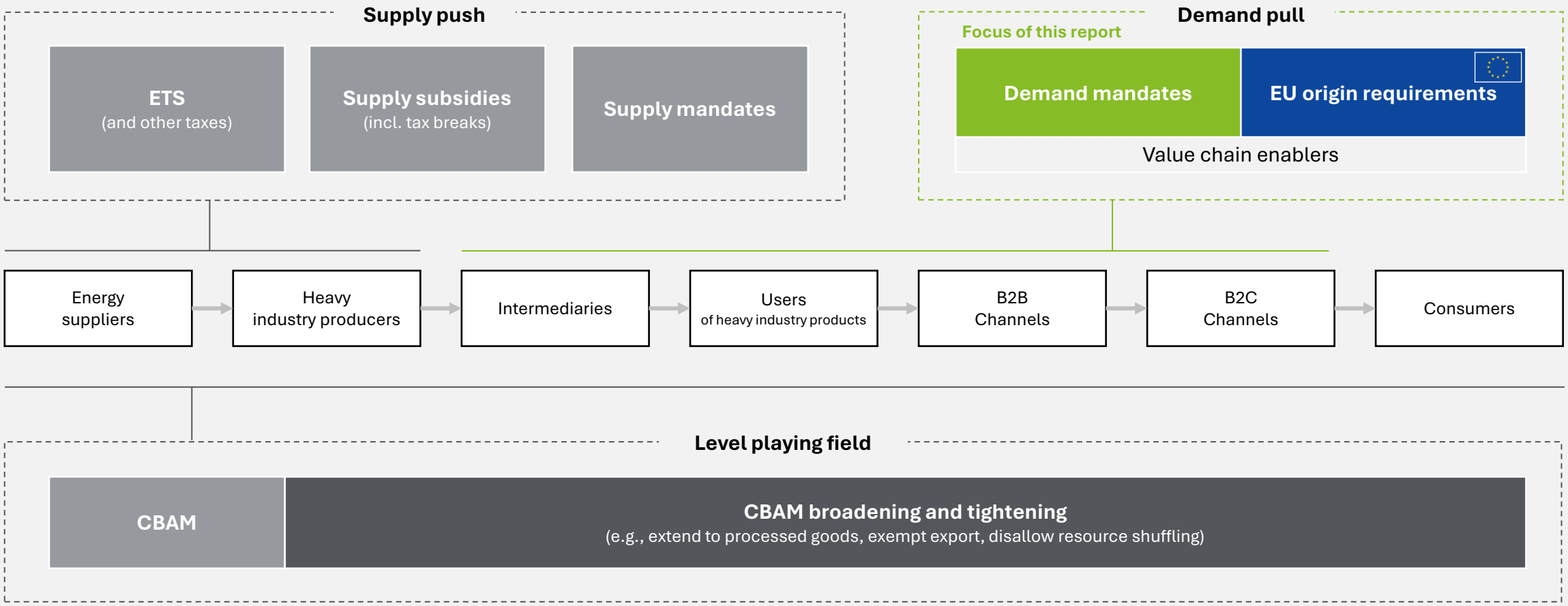
Investments in lower-emission solutions are not viable, given significant cost difference leading to a value gap of ~€100B annually

Conventional vs. green alternative costs by sector (2024)



Extend current policies tightening CBAM and implementing demand-side mandates

Potential policy instruments to improve EU competitiveness and boost uptake of sustainable products

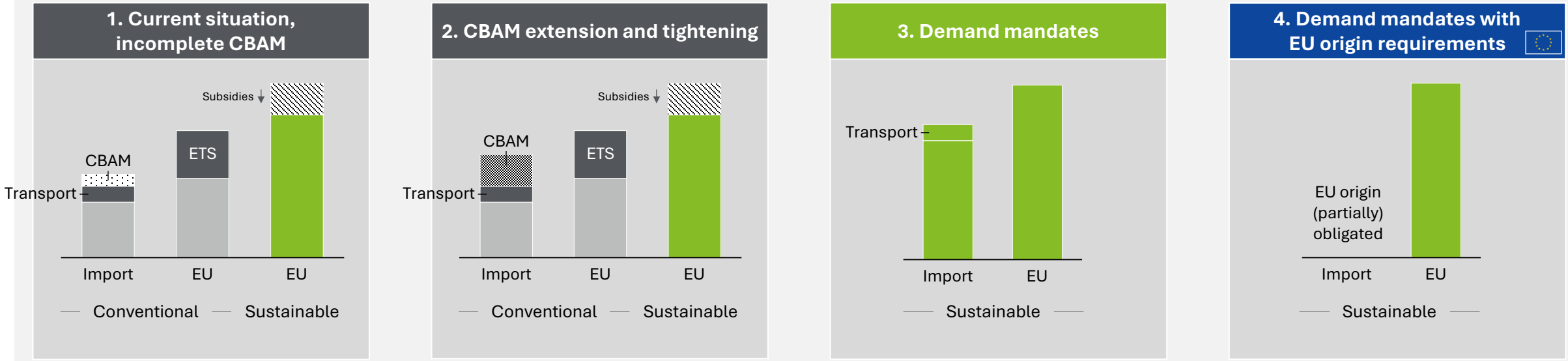


Demand mandates could reverse the shift to imports and boost uptake of sustainable products

Existing and planned instruments

Focus of this report

Potential new instruments



Cost of low-carbon production in price of end products is relatively small

Potential price increase of selected products if sustainable materials are used – ILLUSTRATIVE EXAMPLES

	End-markets	End-products	Example used	Price increase from sustainable solution			
				Current price	Of which input cost	Input cost increase	Price increase (one-off)
Steel	Construction	**House** (foundation, beams, ...)	185 m^2 house	€500,000	€1,601	**+137%** BF-BOF (ETS €75) vs. DRI-EAF (Green H_2)	0,2%
		Wind turbine	5MW offshore turbine	€3,000,000	€88,200		4,2%
	Automotive	**Car** (chassis, engine, ...)	Toyota Aygo X	€27,500	€198		0,7%
		Truck (chassis, engine, ...)	MAN TGS 33.480 6x6	€150,000	€1,323		0,8%
	Groceries	**Steel canned** tomatoes	Supermarket house brand	€0.69	€0.03		6,7%
	White goods	**Fridge**	300l fridge freezer comb.	€700	€23		3,7%
Fertilizers	Groceries	**Tomatoes** (fresh)	1 kg Roma house brand	€3.67	€0.01	**+244%** SMR (ETS €75) vs. SMR (Green H_2)	0,3%
		Fries (frozen)	1 kg house brand	€1.79	€0.004		0,5%
		Bread	Entire whole-wheat bread	€1.75	€0.01		1,8%
Chemicals	Groceries	**Water** (plastic bottle)	330ml house brand	€0.890	€0.02	**+66%** Cracker (ETS €75) vs. Cracker (pyrolysis oil)	1,8%
		Shampoo (bottle and content)	300ml bottle	€2.75	€0.12		2,7%
	Automotive	**Car** (interior, electronics, ...)	Toyota Aygo X	€27,500	€272		0,6%
		Truck (interior, electronics, ...)	MAN TGS 33.480 6x6	€150,000	€778		0,3%
	Construction	**House** (PVC, ...)	185 m^2 house	€500,000	€6,045		0,7%
Refining	Transport	**Parcel delivery** (diesel)	Last-mile delivery	€3	€0.06	**+7%** Refining (ETS €75) vs. Refining (CCS + Green H_2)	0,1%
		Flight (kerosene)	Direct AMS – JFK	€500	€89		1,3%
		Shipping (heavy fuel oil)	1TEU SHG - RTM	€4,000	€439		0,8%
	Construction	**Highway** (bitumen)	1km ZOAB highway	€20,000,000	€180,000		0,1%
		House (roofing bitumen)	185 m^2 house	€500,000	€38		0.0%
References	Average VAT EU						21,8%
	Total inflation EU '15 – '24 (average annual 2.7%)						30,2%

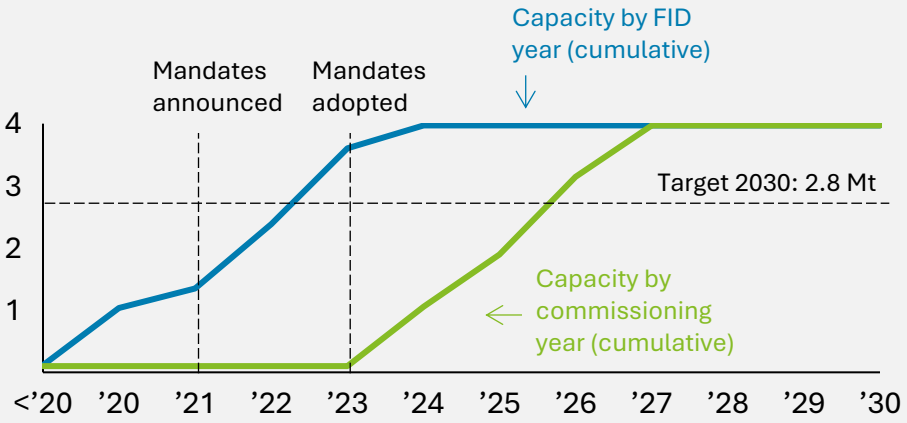
Reality shows that demand-side mandates can stimulate sustainable investments in the EU

Recent demand mandates and resulting EU investments

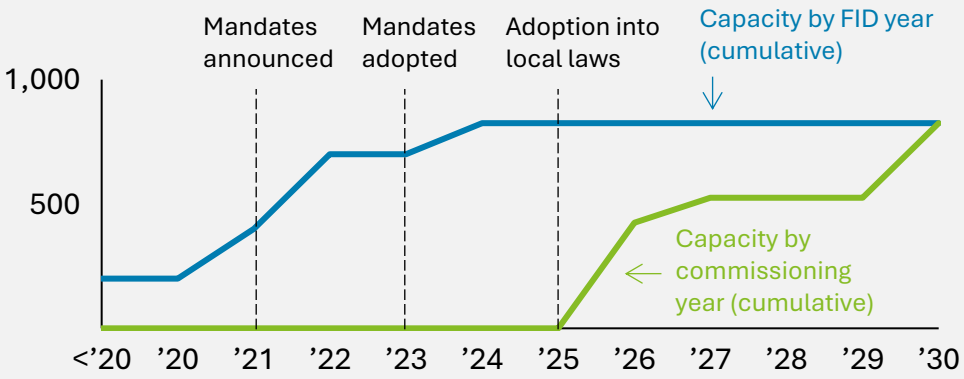
ReFuelEU Aviation:
EU-wide Sustainable Aviation Fuel (SAF) blend mandate

RED III – Green H_2 mandates for transport, enabled through a "refinery route"

SAF – production capacity (Mt p.a.)



Green H_2 for refining – production capacity (MW)



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Why additional demand creation is necessary

What could be a conceptual architecture of demand mandates

How could the mandates be implemented

Demand mandates to be designed with clear principles

Proposed principles for demand mandate

Scale	Effectiveness	Feasibility	Competitiveness
Mandate should target a material share of emissions	Mandate should stimulate actionable demand and supply	Mandate should be implemented and enforced at reasonable cost	Mandate should maintain a level playing field for EU producers
✓ Applies to products with significant **EU industrial emissions**	✓ Applies where **consumers cannot bypass** the mandate	✓ Adds marginal reporting or tracking **costs for companies**	✓ **Importers are held to the same standards** as EU producers
✓ Targets **main sources** of lifecycle emissions	✓ Producers are technically and economically **able to scale** supply	✓ Targets a manageable number of products and companies	✓ Green premiums paid by EU citizens are used on **investments in EU**

Five key choices must made to design a demand mandate

Proposed demand mandate design framework (key choices)

Design choices	Choices	Criteria to design a specific demand mandate
1 MARKETS AND PRODUCTS	Sector-specific (explored later)	1.1 Where the **consumption** (and emissions) is the highest 1.2 Where **products** are relatively **similar**, so mandates do not require many variations 1.3 Where there are **barriers to import** (e.g., high transport cost) so EU producers can compete *Preference for products where heavy industry inputs account for large share of emissions*
2 MANDATE HOLDERS		2.1 Companies that are **concentrated** (small number accounts for large share of volume) 2.2 Companies that are **close to end-users** (to avoid circumvention, spread cost)
3 MANDATED METRICS	Lifecycle emissions Production emissions Production technology Specific feedstock	3.1 Metrics that address **main sources of lifecycle emissions** 3.2 Emissions and solutions **complementary to existing mandates**
4 COMPLIANCE MECHANISMS	Product tracking Mass-balance Book-and-claim	4.1 A model that **minimizes burden** on production, supply chains, and enforcement 4.2 A model that most directly **supports sustainable investments**
5 ACCESS AND ORIGIN REQUIREMENTS Limited focus		5.1 Stimulate **healthy competition**, helping supply emerge quickly and at acceptable cost 5.2 Ensure EU producers and importers have the **same basis of competition** 5.3 Is **aligned with free trade rules**

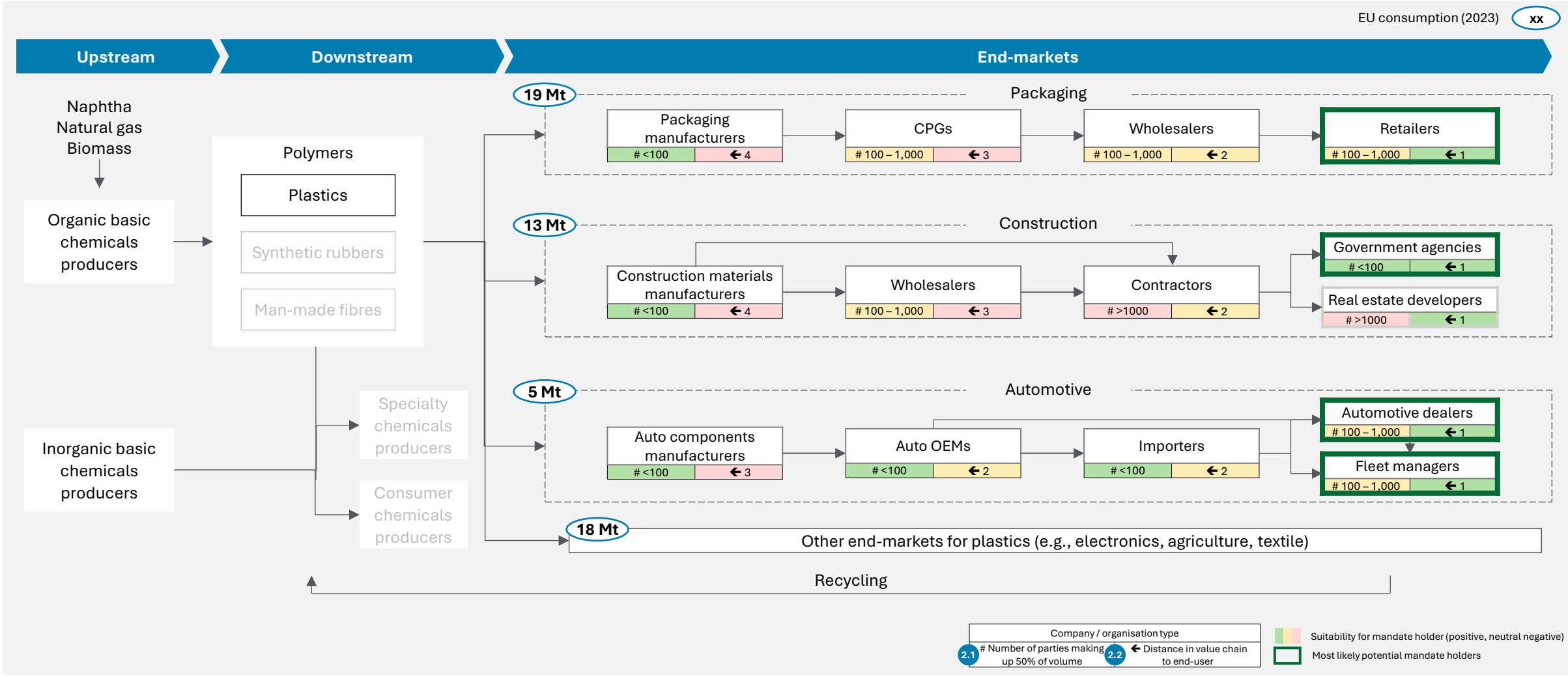
Chemicals: Packaging, construction and automotive seem good fits for a mandate for plastics

Finished chemicals end-market selection for demand mandate (2023)

Favorable | Neutral | Unfavorable | Candidate end-markets for initial demand mandates

Type	End-market	Example products	**Scale** (where emissions are highest) – EU emissions (Mt) 1.1	**Feasibility** (where products are relatively similar) 1.2	**Competitiveness** (where there are barriers to import) 1.3
Plastics (56 Mt, 37%)	Packaging	Plastic bottles, food containers,...	8		
	Construction	Pipes, insulation, window frames,...	6		
	Automotive	Bumpers, body panels,...	2		
	Electronics	Casings, cable insulation,...	2		
	Houseware	Kitchen bowls, furniture,...	1		
	Agriculture	Greenhouse covers, irrigation pipes,...	1		
	Other	Medical equipment, textiles,...	4		
Synthetic rubbers		Tires, seals, conveyor belts,...	1		
Man-made fibers		Protective gear, carpets,...	0		
Specialty chemicals		Adhesives, sealants, paints,...	10		
Consumer chemicals		Cleaning, personal care,...	3		
Total consumption			37		
Basic chemicals sold to end-markets and used in process			16		
Exported emissions			27		
Total EU emissions			81		

Chemicals: Retailers and government seem to be good fits as mandate holders for plastics

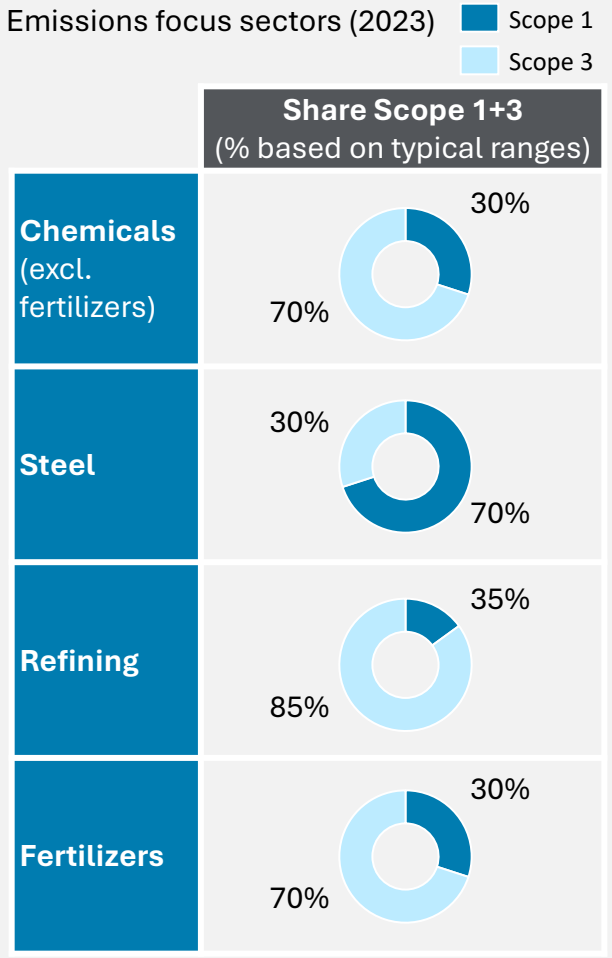


Mandated metrics should address main emission sources and complement existing mandates

Main types of mandate metrics – SIMPLIFIED

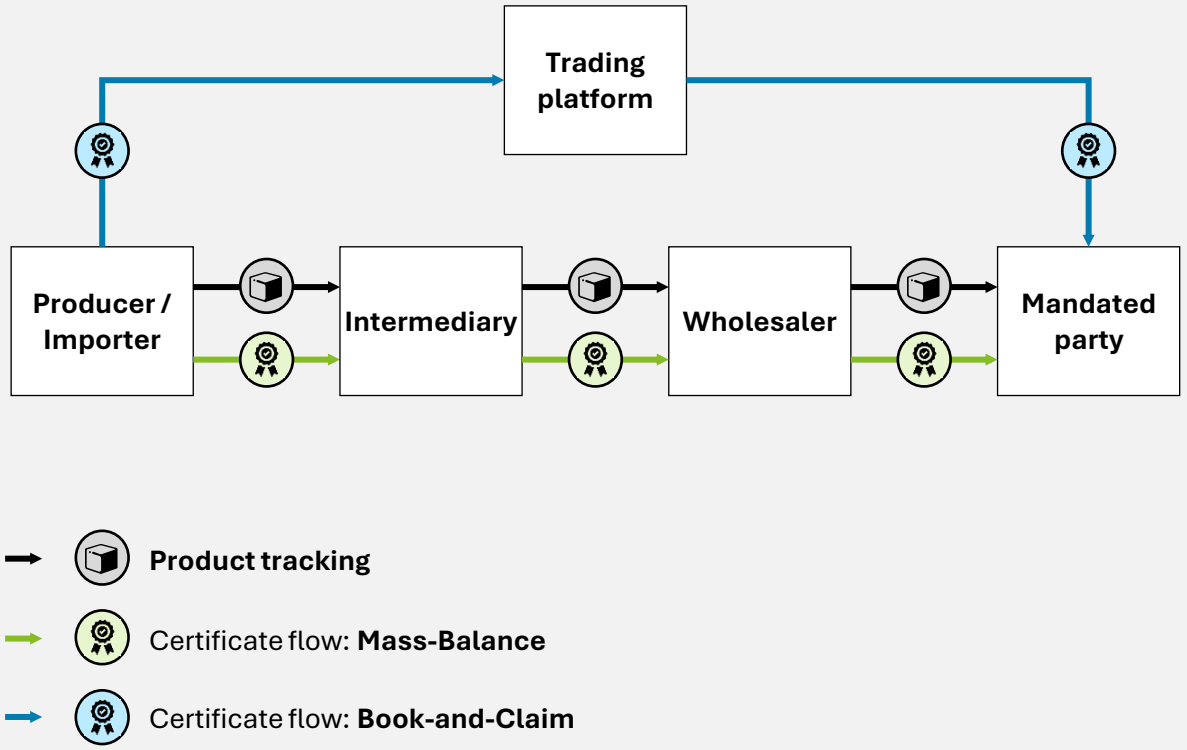
Scope / Metric	**Production (Scope 1)**	**Feedstock (Scope 3)**
Emissions (solutions-agnostic)	Lifecycle emissions	
	Production emissions	Emissions at use (mainly fuels, out of scope)
Specific solutions	Production technology	Specific feedstock

Emissions focus sectors (2023)



Compliance mechanism should minimize burden and support sustainable investments

Typical compliance mechanisms for a demand mandate – SIMPLIFIED

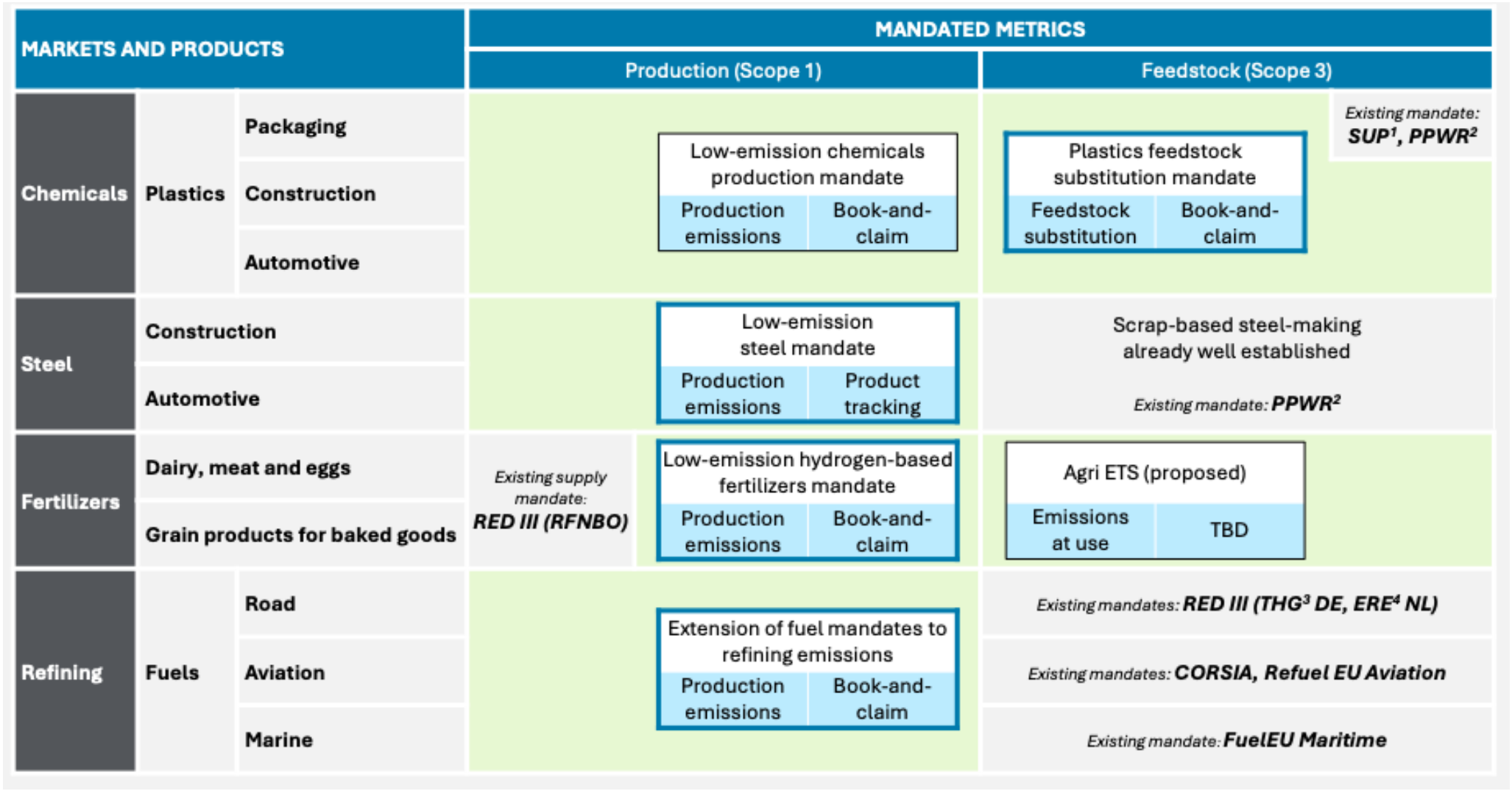


High-level assessment of compliance mechanisms

Likely preferred for most products

	Product tracking	Mass-Balance	Book-and-Claim
Burden 4.1	-	+/-	+
Support of investments 4.2	+/-		+
Intuitive for consumer	+	+/-	+/-
Example	Forest Stewardship Council (FSC 100%)	E10 gasoline, EU emission standards for cars and vans, RSPO model for palm oils	Green electricity (PPA), biomethane blending obligation, CORSIA – carbon offsets for aviation

Five potential high-priority mandates emerge across the focus sectors



Mandate option
Mandated metric

Mandate gaps

Examples shown earlier

Existing policies could provide a starting point, either directly or as indirect enablers

Existing policies that can form basis for demand mandates – EXAMPLES

Mandates – possible basis for extension

Mandates – would require extensive modifications

Other policies and enablers – could support new mandates

(P) Proposed policies

Policy	Sectors impacted					Type of policy
	Chemicals	Steel	Refining	Fertiliers	Other	
RED III – THG DE and ERE NL						Emissions at use
Emission Standards					Automotive	Emissions at use
FuelEU Maritime					Maritime	Emissions at use
CORSIA					Aviation	Emissions at use
Agricultural ETS (P)					Agriculture	Emissions at use
Packaging & Waste Regulation						Specific feedstock
RefuelEU Aviation					Aviation	Specific feedstock
RED III – **RFNBO mandate**						Production technology
Ecodesign for Sustainable Products						Regulatory framework
Fertilizing Product Regulation						Standard
Fuel Quality Directive						Reporting, Standard
End of Life Vehicles					Automotive	Standards
Construction Products Regulation					Construction	Reporting, Standard
Product Environmental Footprint (P)					Consumer goods	Methodology
General Food Law					Consumer goods	Standards
Food Info. to Consumers					Consumer goods	Standards

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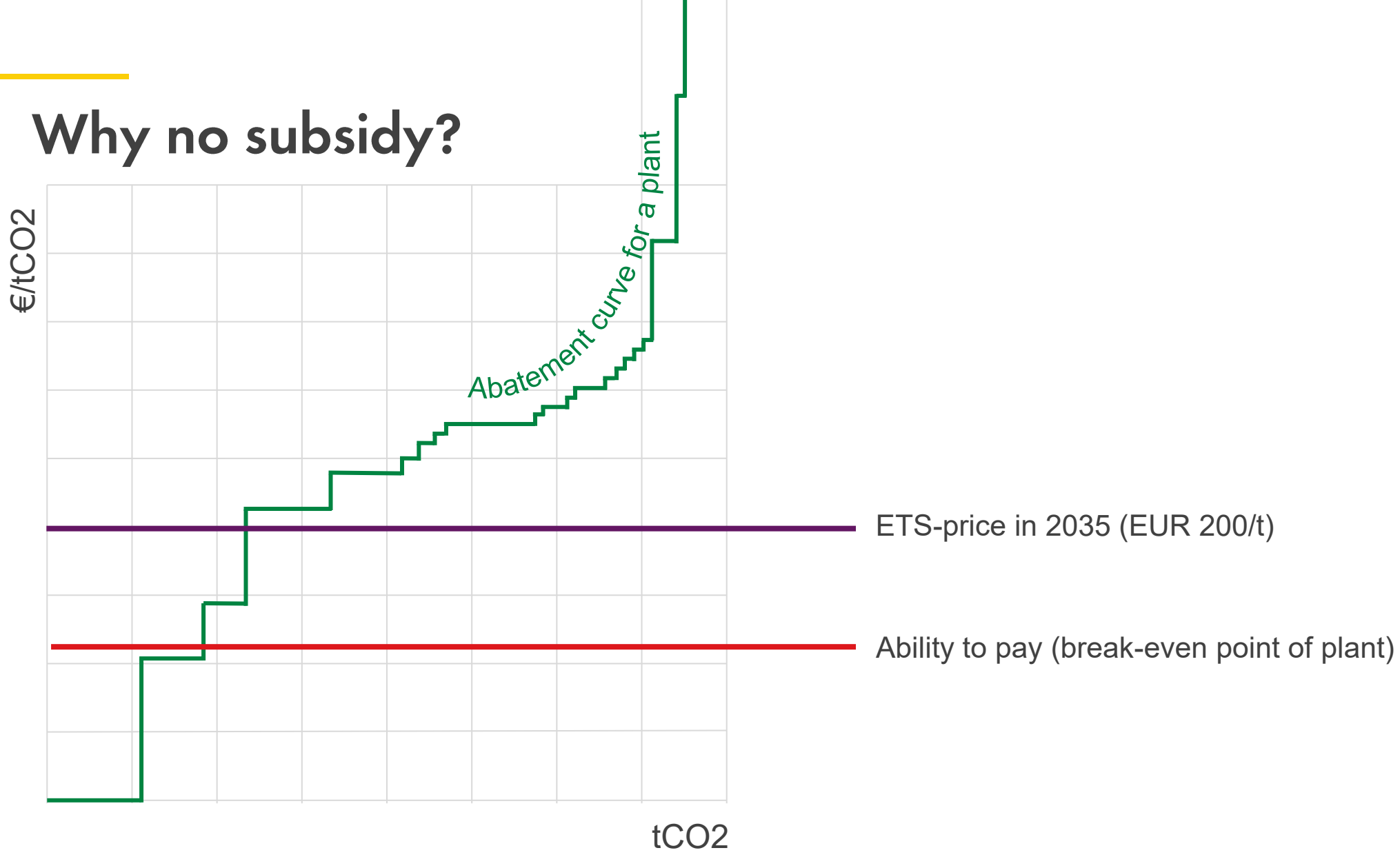
Chemie

Demand Creation voor Chemie

Arnold Mulder
CR Manager Energy Transition Projects

Why no subsidy?



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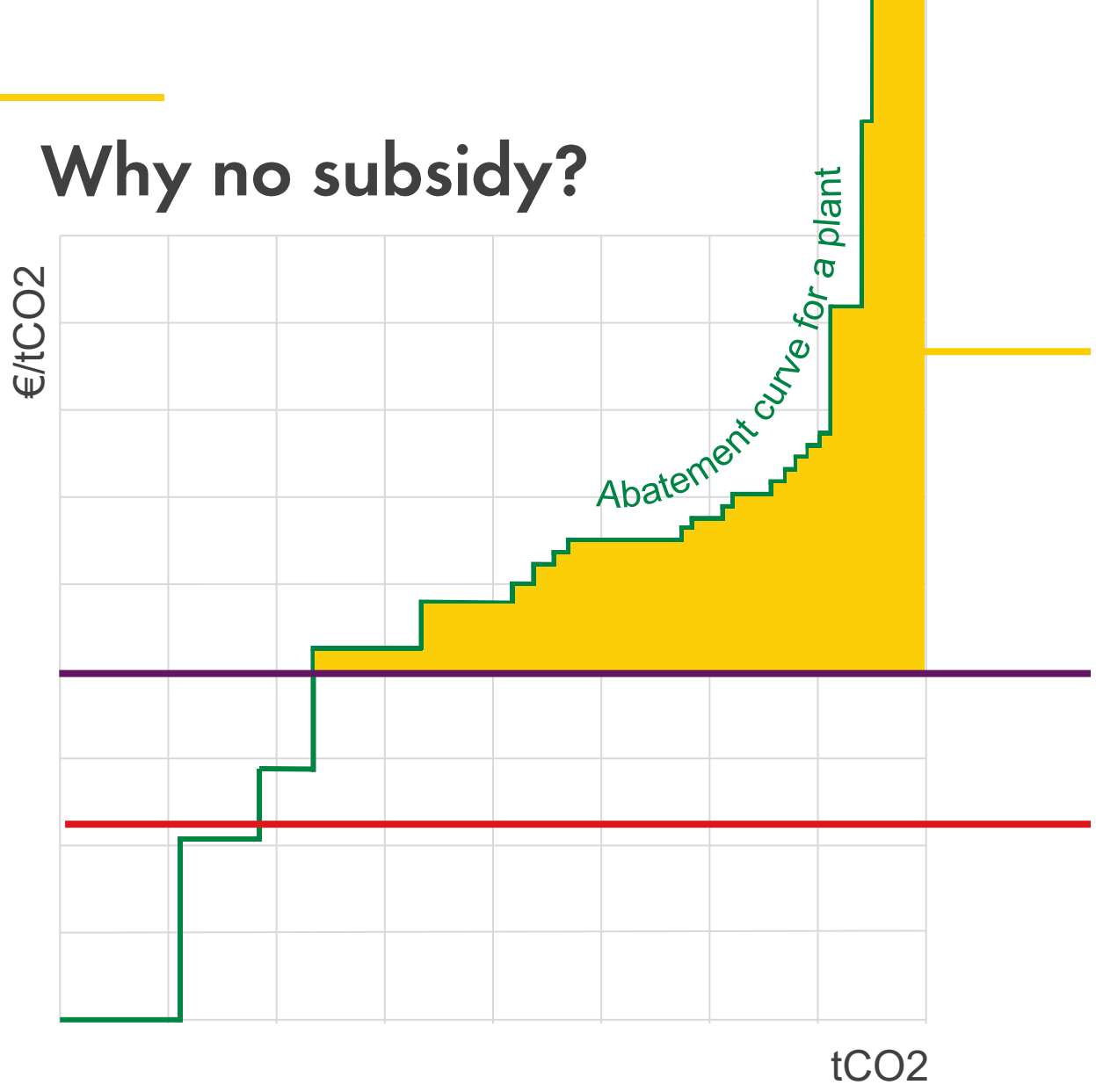


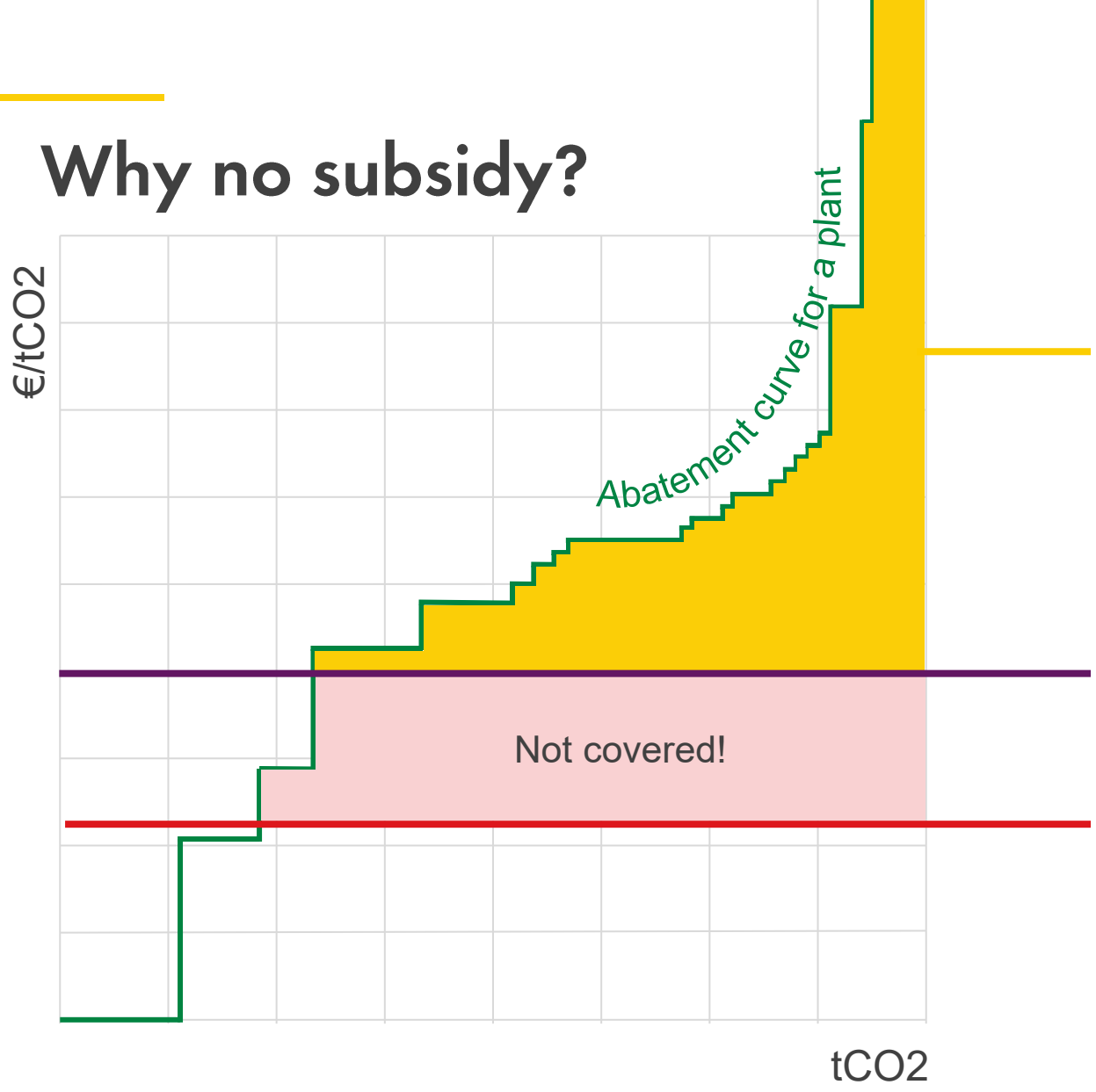
Theoretical coverage of subsidies:

- IF budgets would be large enough
- IF governments are not hesitant to support energy-intensive industry
- IF high subsidy-intensity would be supported
- IF companies apply in advance for exactly the optimal amount of subsidy
- IF companies ACCEPT loss-giving decarbonization

ETS-price in 2035 (EUR 200/t)

Ability to pay (break-even point of plant)

Why no subsidy?



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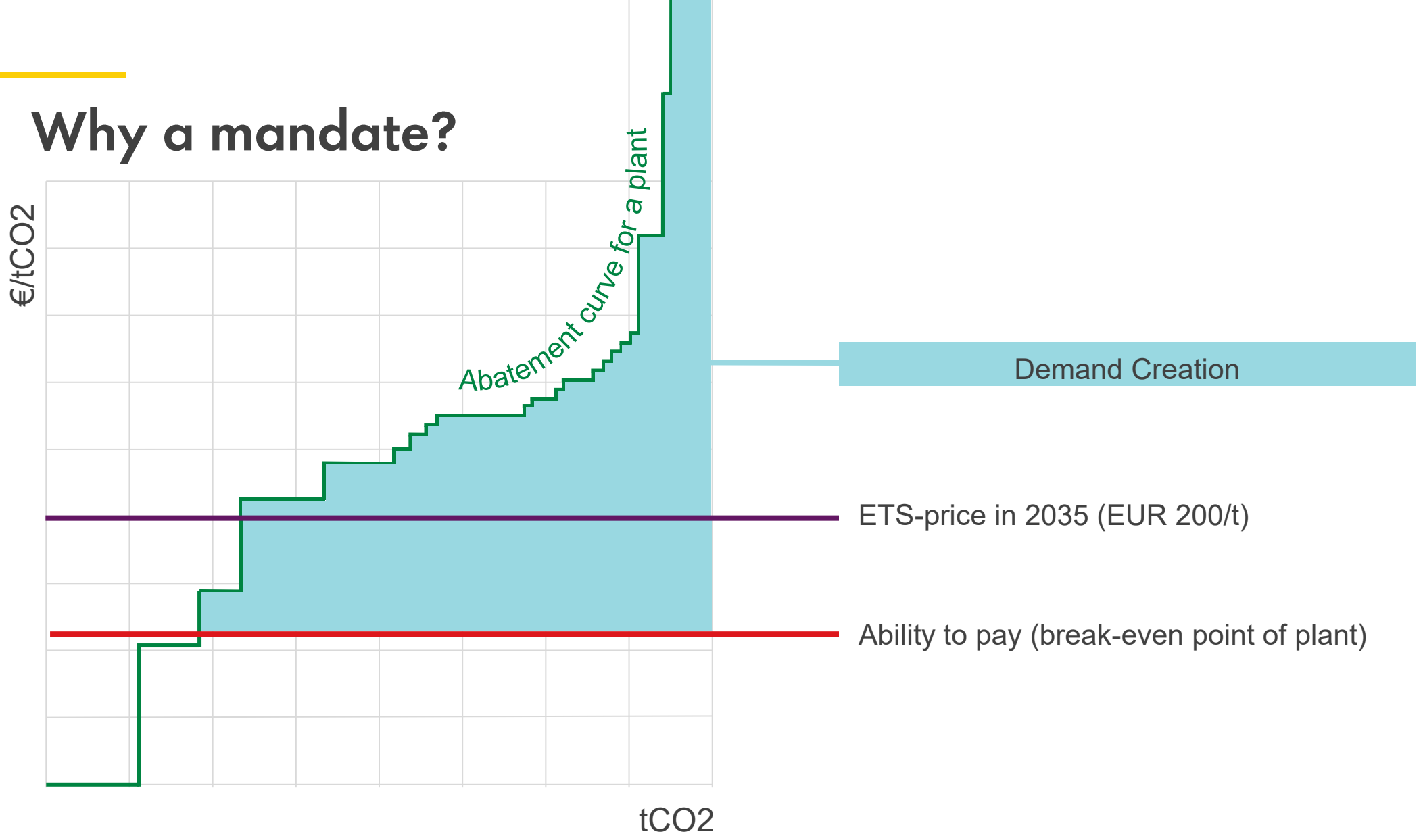
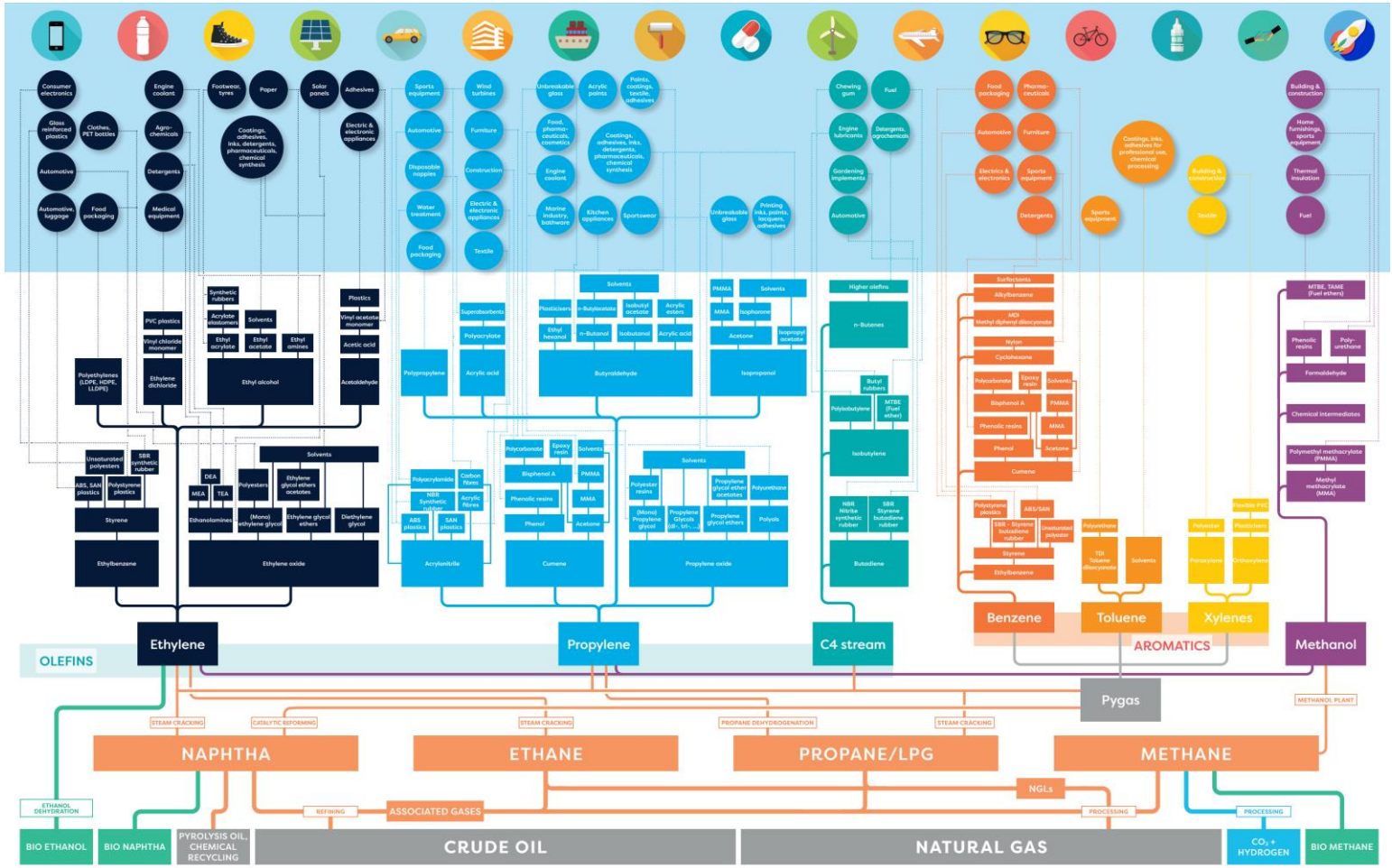
Why a mandate?



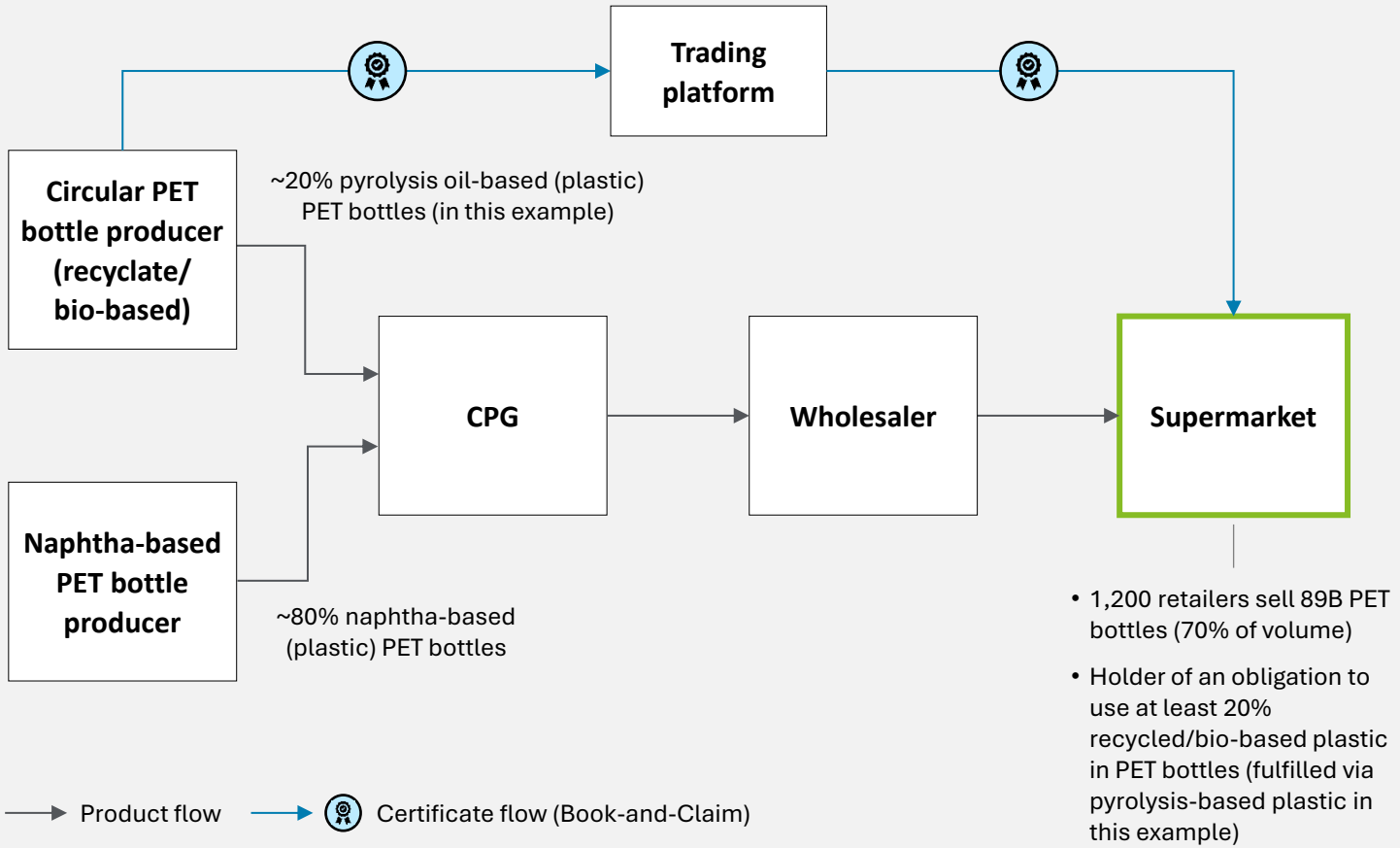
Why Book-and-Claim?



Chemicals value-chains are too complex for Product tracking and Mass-balance systems. These alternatives would fail (CBAM for Chemicals is failing for the same reason). Book-and-Claim is effective AND efficient!

Example: **Chemicals** specific feedstock mandate on Retailers – Book-and-Claim

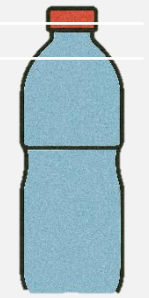
Compliance mechanism - ILLUSTRATIVE



Mandate holder perspective

		Value
PET bottles sold by 1,200 largest supermarkets		89 B
PET content of the bottles sold		2,200 kt
Mandate (recycled/bio-based plastic)		Minimum 20%
Mandated volume		440 kt
Lifecycle CO_2 from PET (CO_2e)	**As-Is**	5.1 Mt
	To-Be	4.2 Mt
	Potential reduction	**0.9 Mt**

Cost components of PET bottle (1 liter carbonated soft drink)



5% Other production

10% Materials

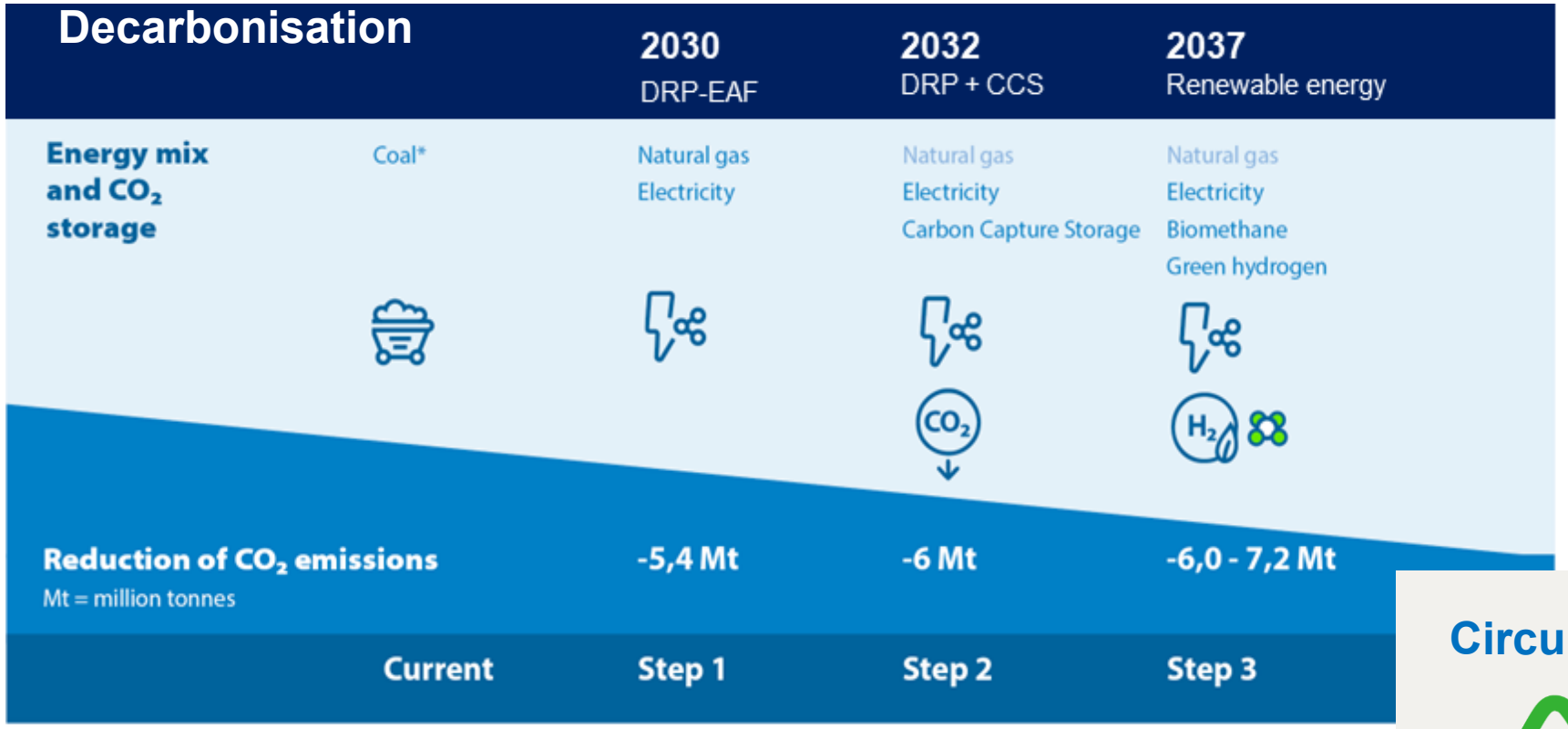
+0.2% if 20% recycled/bio-based plastic is used (fulfilled via pyrolysis oil-based plastic)

85% Distribution, marketing, margin,...

Staal


TATA STEEL
TATA
Tata Steel Nederland
Towards a clean, green and circular steel industry
Together we make the difference

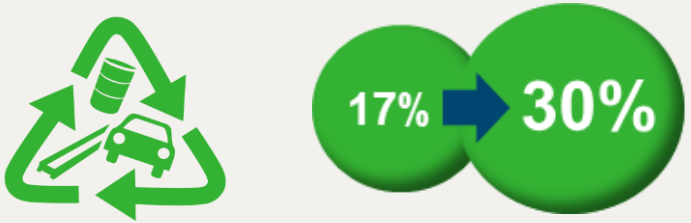
JLOI, de transitie start met een reductie van 40% van de CO2-uitstoot



Groen staalplan leidt tot:

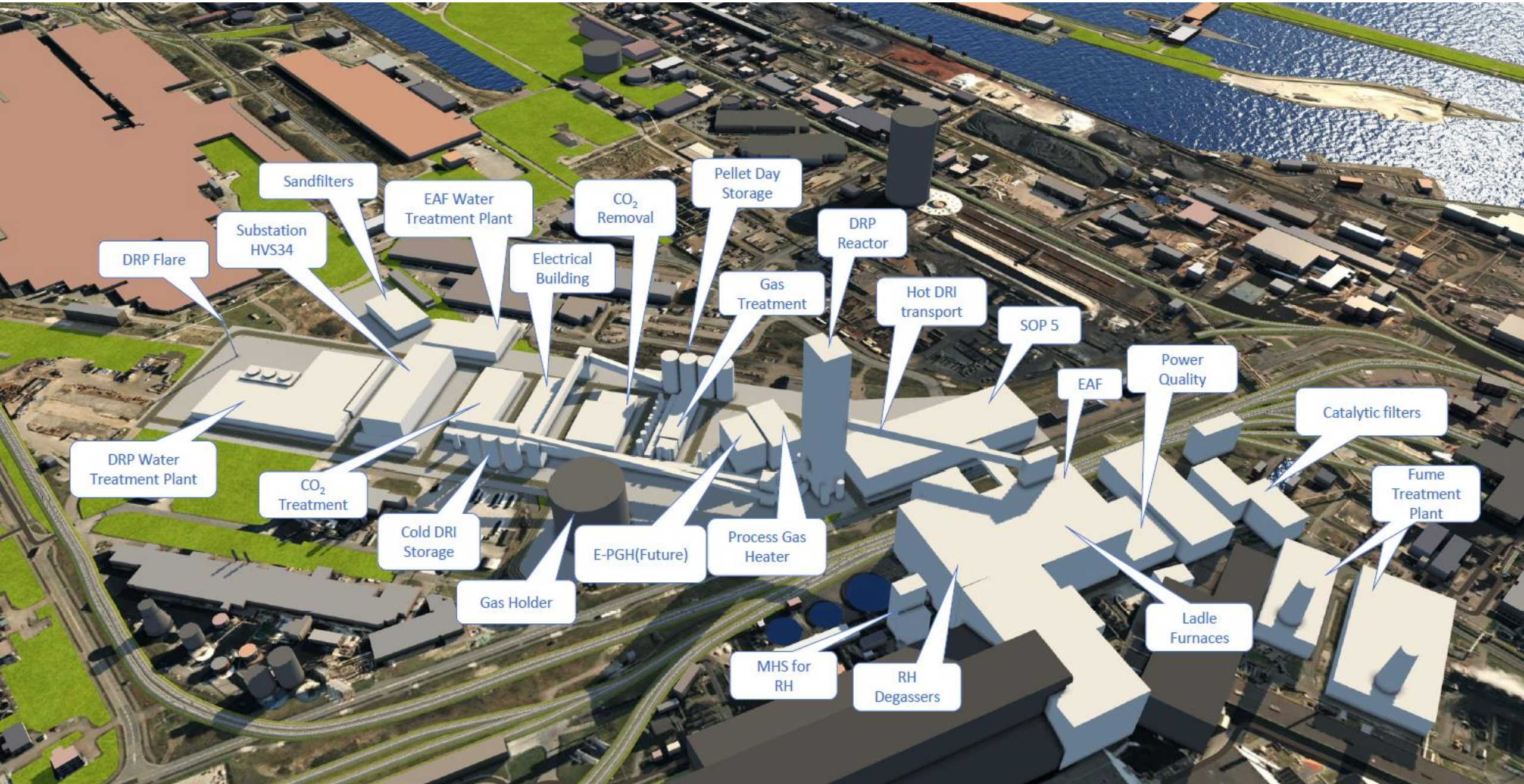
- Minder CO2 emissies
- Gezondere leefomgeving
- Meer circulariteit

Circularity



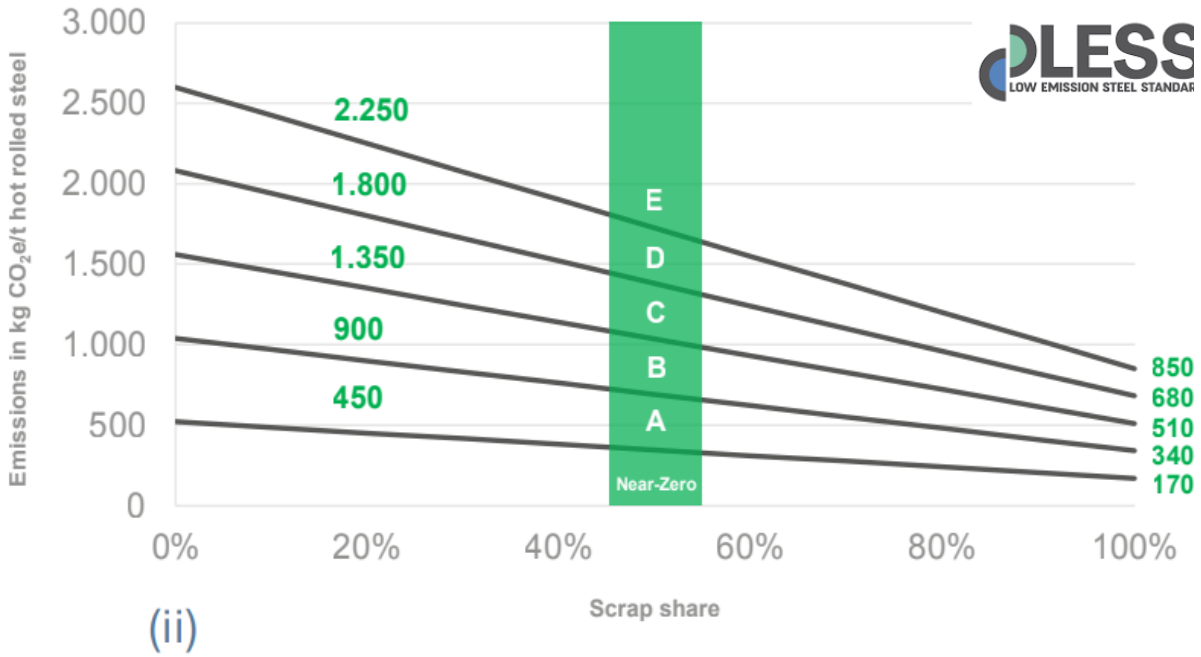
Scrap usage today versus **2030**

Impressie van de nieuwe fabrieken



Wat is groen staal

De Low Emission Steel Standard (LESS) helpt om producten te classificeren



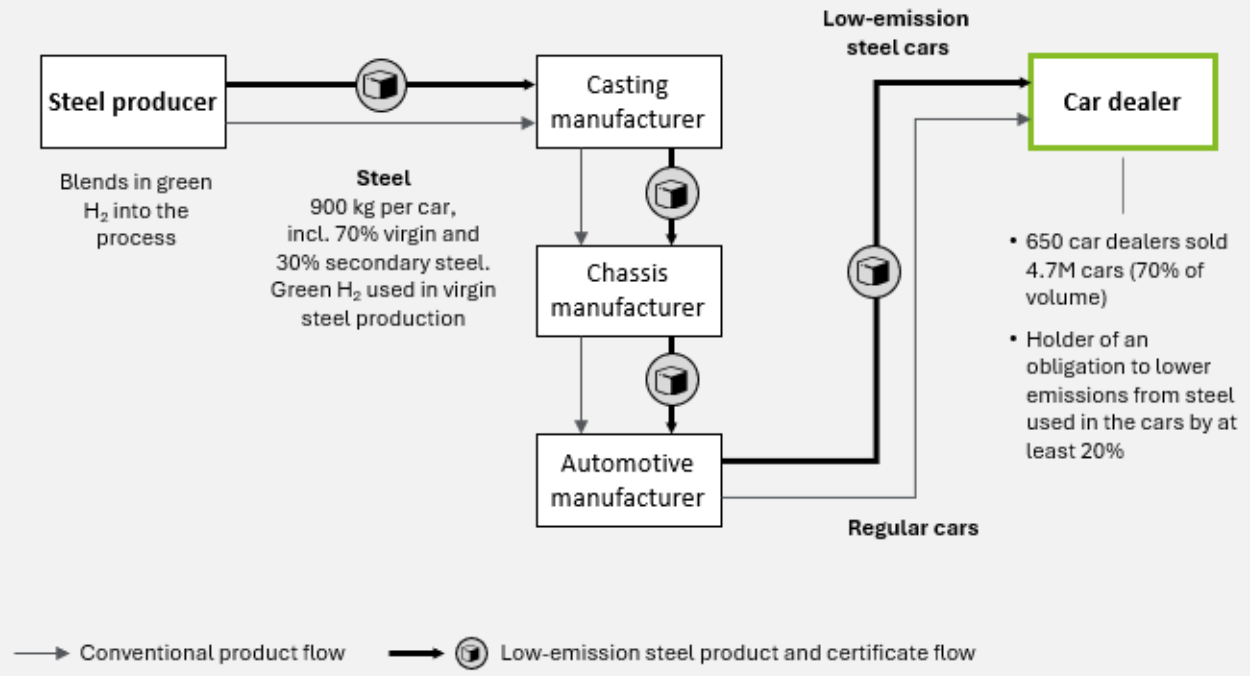
- Extra schrootgebruik verlaagt de CO2-voetafdruk van een staalproduct.
- Er is wereldwijd niet genoeg schroot om aan de vraag naar staal te voldoen en al het schroot wordt al gebruikt vanwege de intrinsieke waarde ervan.
- Een duidelijke sturing op het gebruik van meer schroot om een lagere CO2-voetafdruk te bereiken, heralloceert schroot naar markten die een lage CO2-voetafdruk eisen en investeringen in de decarbonisatie van primaire staalproductie niet ondersteunen.
- Het decarboniseren van de productie van primair staal is de sleutel tot het decarboniseren van de staalindustrie. Daarom moet een label met een lage CO2-uitstoot onderscheid kunnen maken tussen decarbonisatie-effecten en de effecten van de product-CO2-voetafdruk als gevolg van schrootgebruik.

LESS heeft de 'decarbonisatie'-schaal ontwikkeld, waarmee de decarbonisatie-effecten voor zowel de primaire als de secundaire staalproductie kunnen worden weergegeven en gewaardeerd

Om effectief te zijn, moeten gekozen markten aansluiten bij onze mogelijkheden voor staalproductie

Als we kijken naar de autoindustrie

Compliance mechanism - ILLUSTRATIVE



Mandate holder perspective

		Value
Cars sold by 650 largest car dealers		4.7 M
Required steel		4.3 Mt
CO_2 from steel production (CO_2e)	As-Is	6.1 Mt
	Mandate	Minus 20%
	To-Be	4.9 Mt
	Reduction	**1.2 Mt**

Cost components of regular car

0.9% Steel (900 kg per car)
+0.3% if 20% low-emission steel is used (fulfilled via DRI-EAF-H_2)

Laten we zorgen voor groen hier in plaats van grijs elders
Mandaat moet Europees zodat het een gelijk speelveld blijft

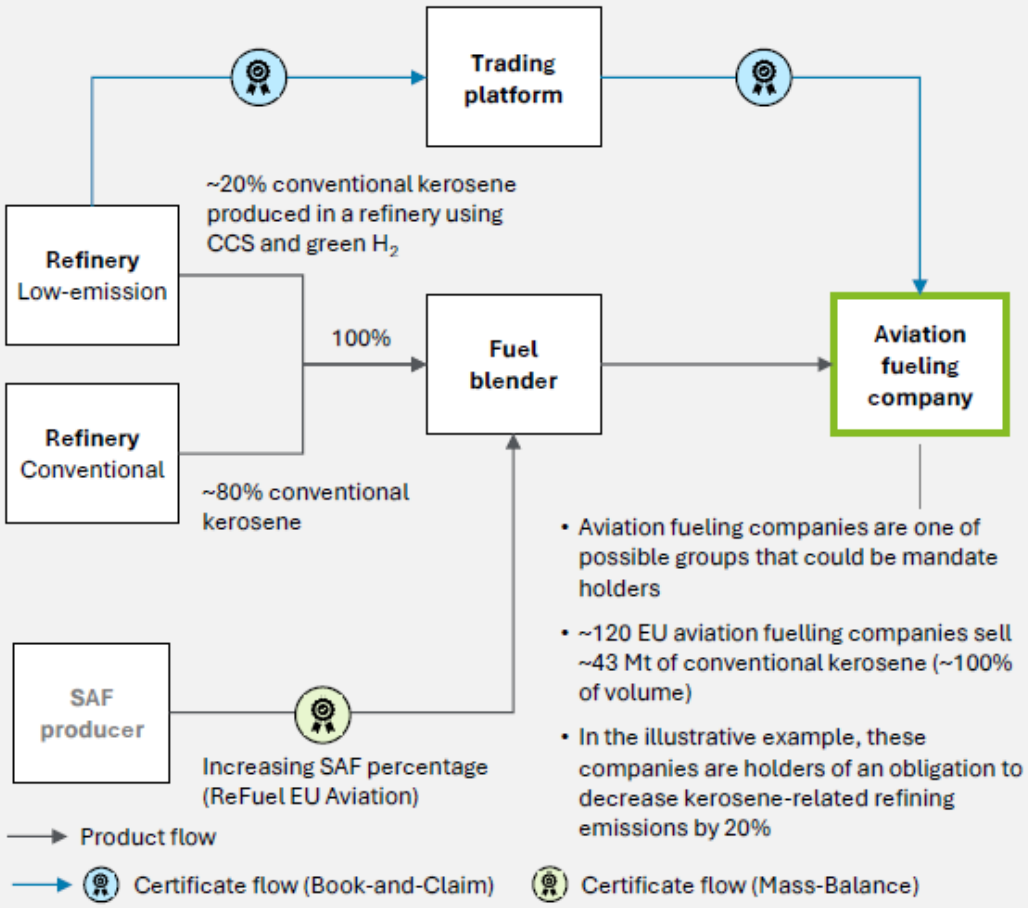
Raffinage

Raffinage

Scope 1: CO2 reductie in productie:
- Stok: ETS
- Markt: geen
- Effect: import zonder CO2 reductie

Scope 3: CO2 reductie in gebruikt:
- Stok: ReFuel
- Markt: gebonden
- Effect: nieuwe industrie.
- Export van innovatie

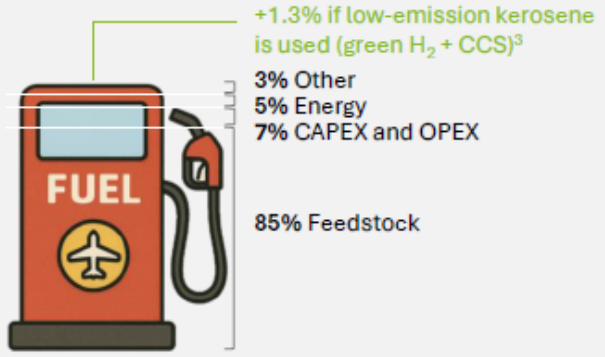
45. Possible mandate mechanics - ILLUSTRATIVE



46. Mandate holder perspective - INDICATIVE

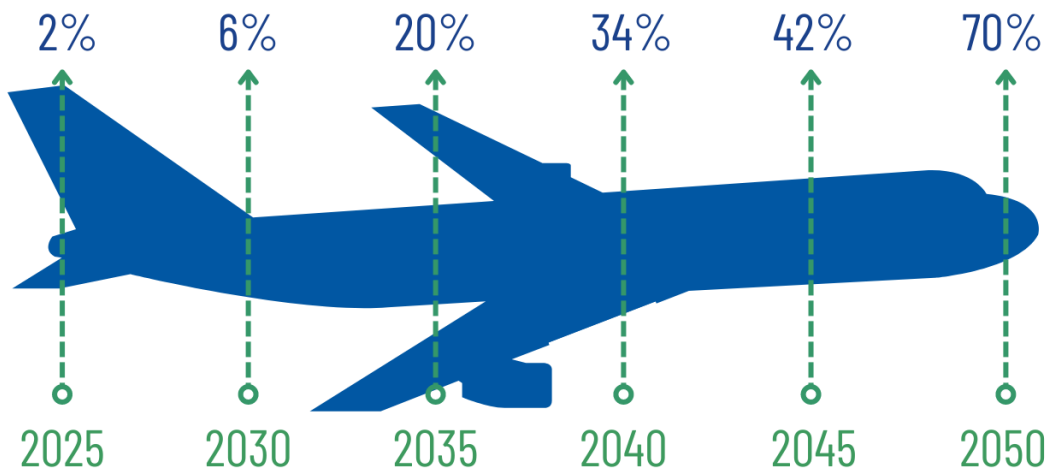
		Value
Conventional kerosene sold[1]		43 Mt
CO_2 from kerosene production (CO_2e)	As-Is[2]	7.2 Mt
	Mandate	Minus 20%
	To-Be	5.8 Mt
	Potential reduction	1.4 Mt

47. Cost components of kerosene (2030)



ReFuelEU – demand creation

Minimum share of supply of sustainable aviation fuels

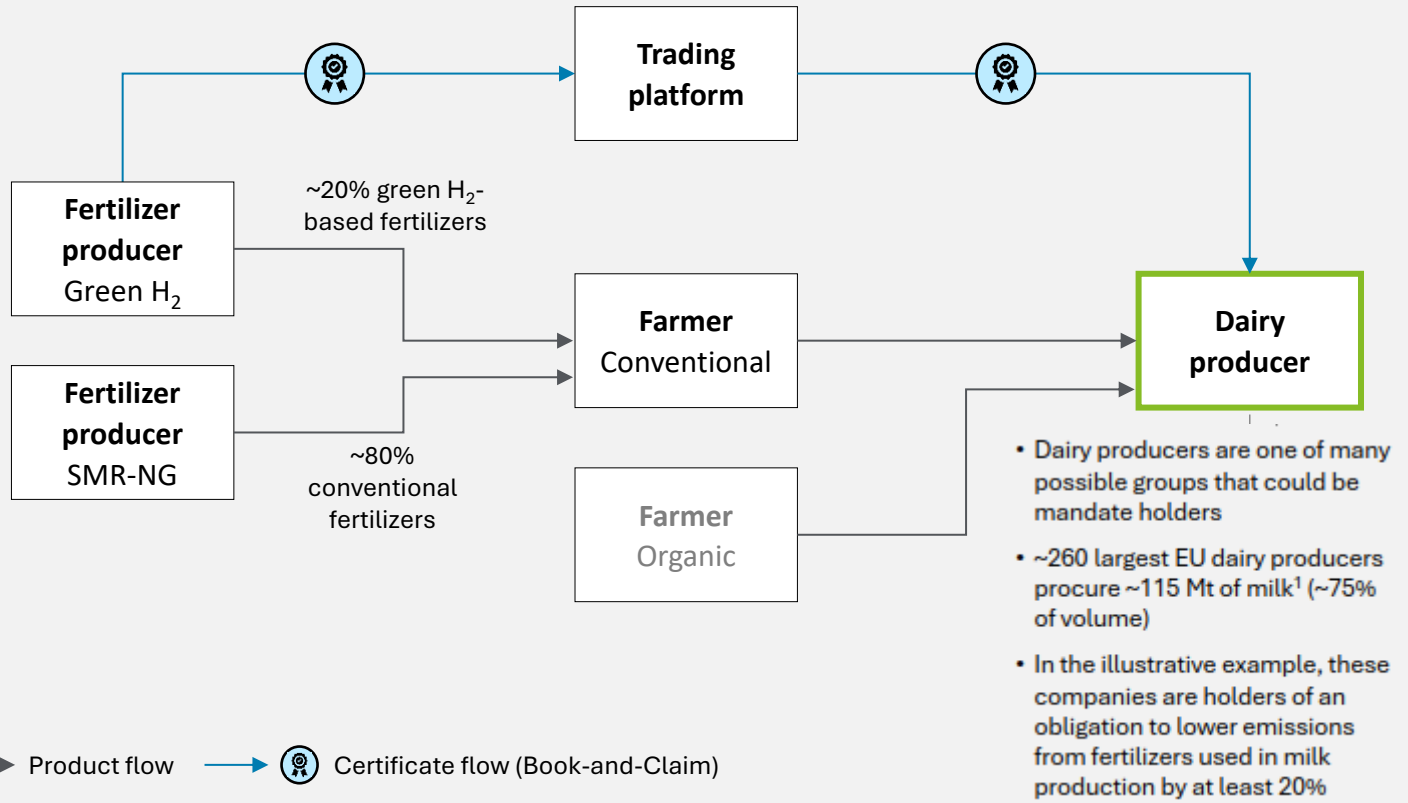


Volume shares (% of aviation fuel to EU airports)	
SAF	**Synthetic aviation fuel**
2%	-
6%	Avg 1.2% (min. 0.7%)
	Avg 2.0% (min 1.2%)
	2.0%
20%	5%
34%	10%
42%	15%
70%	35%

Meststoffen

Example: **Fertilizer** production emissions mandate on dairy producers – Book-and-Claim

Compliance mechanism - ILLUSTRATIVE



- Dairy producers are one of many possible groups that could be mandate holders
- ~260 largest EU dairy producers procure ~115 Mt of milk[1] (~75% of volume)
- In the illustrative example, these companies are holders of an obligation to lower emissions from fertilizers used in milk production by at least 20%

Mandate holder perspective

		Value
Milk procured 260 largest dairy producers		116 Mt
Fertilizer used (NH_3e)		658 kt
Mandated volume (NH_3e)		66 kt
CO_2 from fertilizer production (CO_2e)	**As-Is**	1.1 Mt
	Mandate	Minus 20%
	To-Be	0.9 Mt
	Potential reduction	**0.2 Mt**

Cost components of 1 liter of milk

0.3% Fertilizer (6 g per liter)
+0.2% if 20% green H_2-based fertilizer is used

8% Rent, machinery,...

18% Labor, contractors,...

21% Feed, livestock,...

52% Distribution, marketing, margin, ..

Given concerns about deforestation resulting from production of animal feed, the Book-and-Claim model would likely only be applicable if it was combined with an EU origin requirement

NPVI Nationaal Programma Verduurzaming Industrie

Bedankt voor je aandacht !

Op de hoogte blijven?

- Bezoek onze website: www.verduurzamingindustrie.nl
- Volg onze LinkedIn: programma-verduurzaming-industrie

Direct contact opnemen?

- Communicatie: NPVIcommunicatie@rvo.nl
- Programma: NPVI-Bureau@minezk.nl