





Healing climate policy's Achilles Heel:

Can transport fuels cap-and-trade be the cure?

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The Hakubi Project

The goal of The Hakubi Project is to foster and support young researchers who will pioneer new paths in their respective academic fields, by appointing them as program-specific faculty members (five-year term associate professor/assistant professor under the annual salary system) and by supporting their research activities on themes of their own choices.



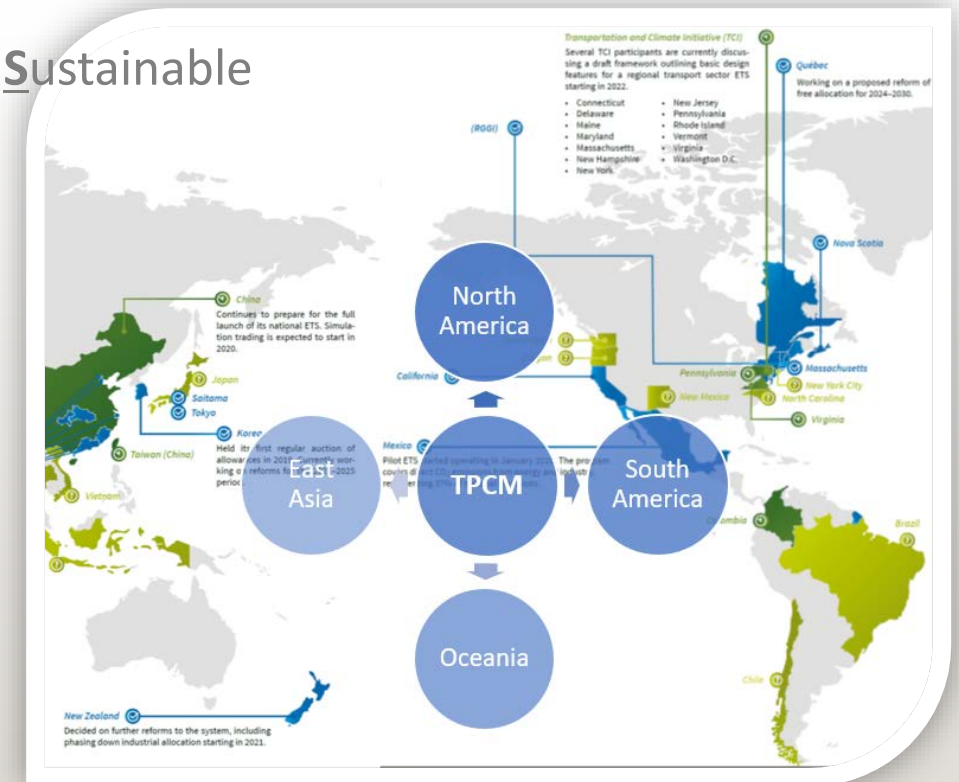
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Kyoto University Graduate School of Global Environmental Studies



Toward a Trans-Pacific Carbon Market: Politically Feasible and Sustainable

Research steps:

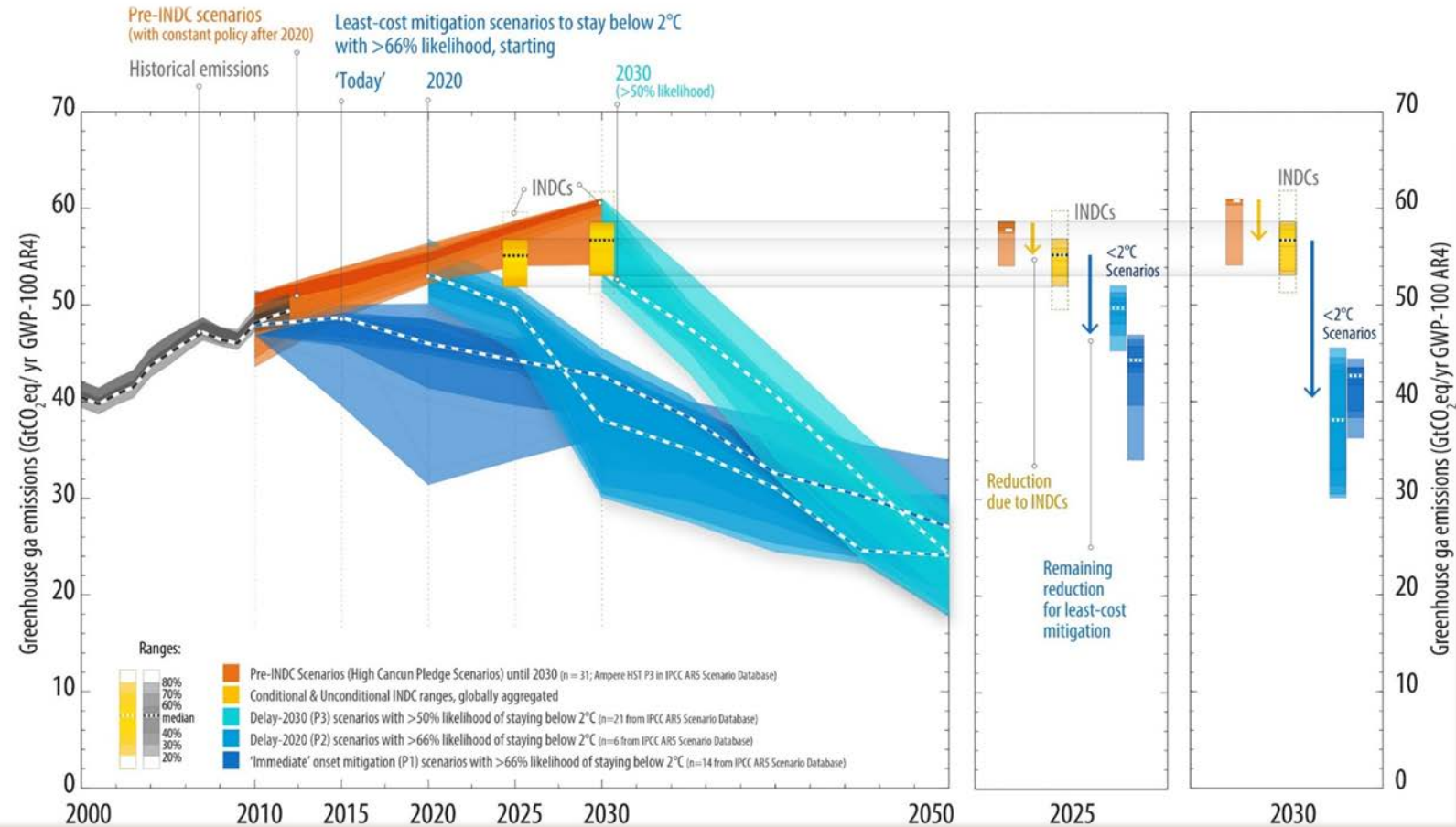
- (1) Define sustainability criteria for carbon markets, apply them to carbon market design, and evaluate domestic schemes in the Pacific region.
- (2) Identify prerequisites for sustainable linking and check existing and upcoming domestic carbon markets for necessary adjustments.
- (3) Analyze political chances and obstacles in the respective jurisdictions and identify strategies to utilize the former and overcome the latter.



Methodological approaches:

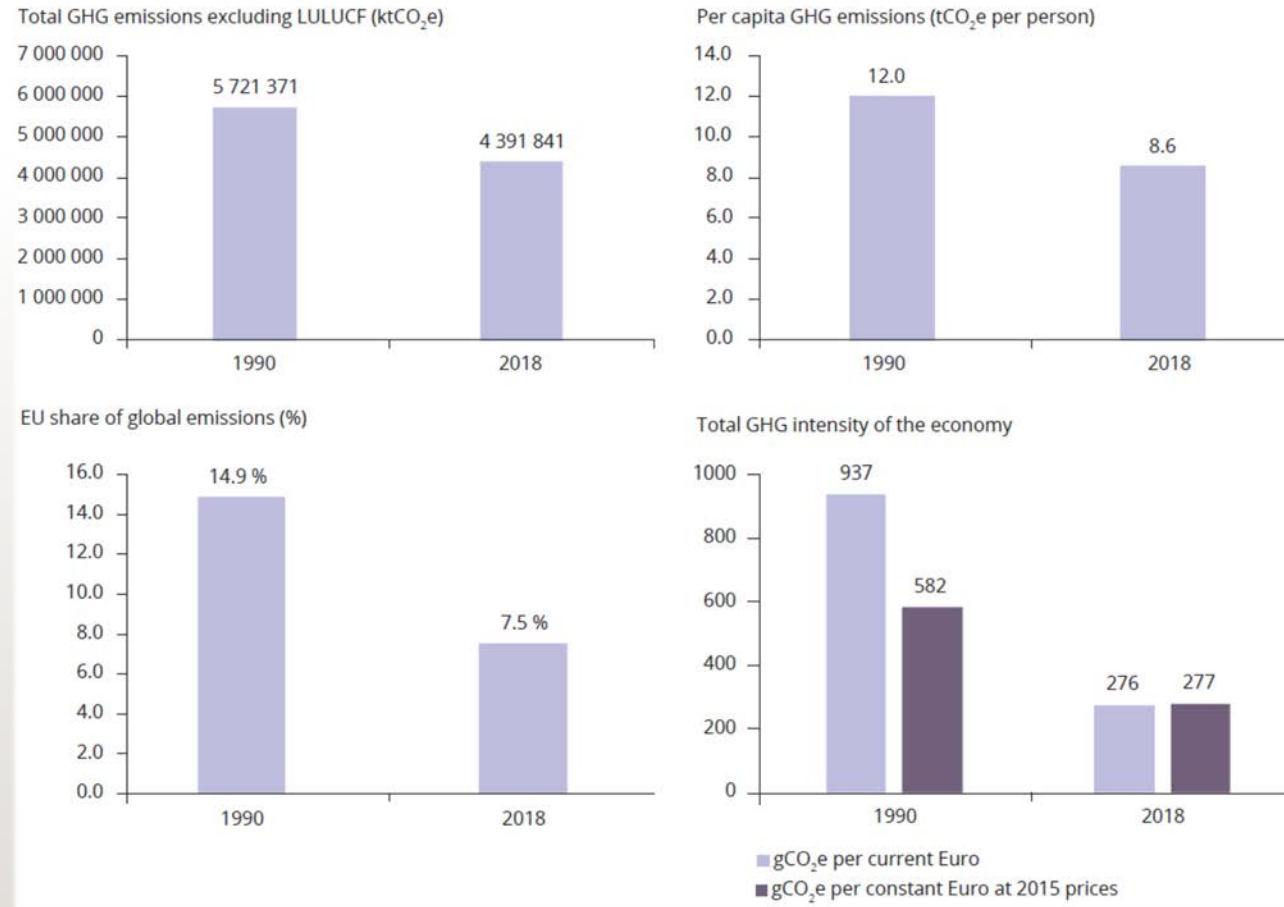
- Sustainability Economics, New Political Economy
- Case studies (qualitative, quantitative)

Achilles' body (global), ...



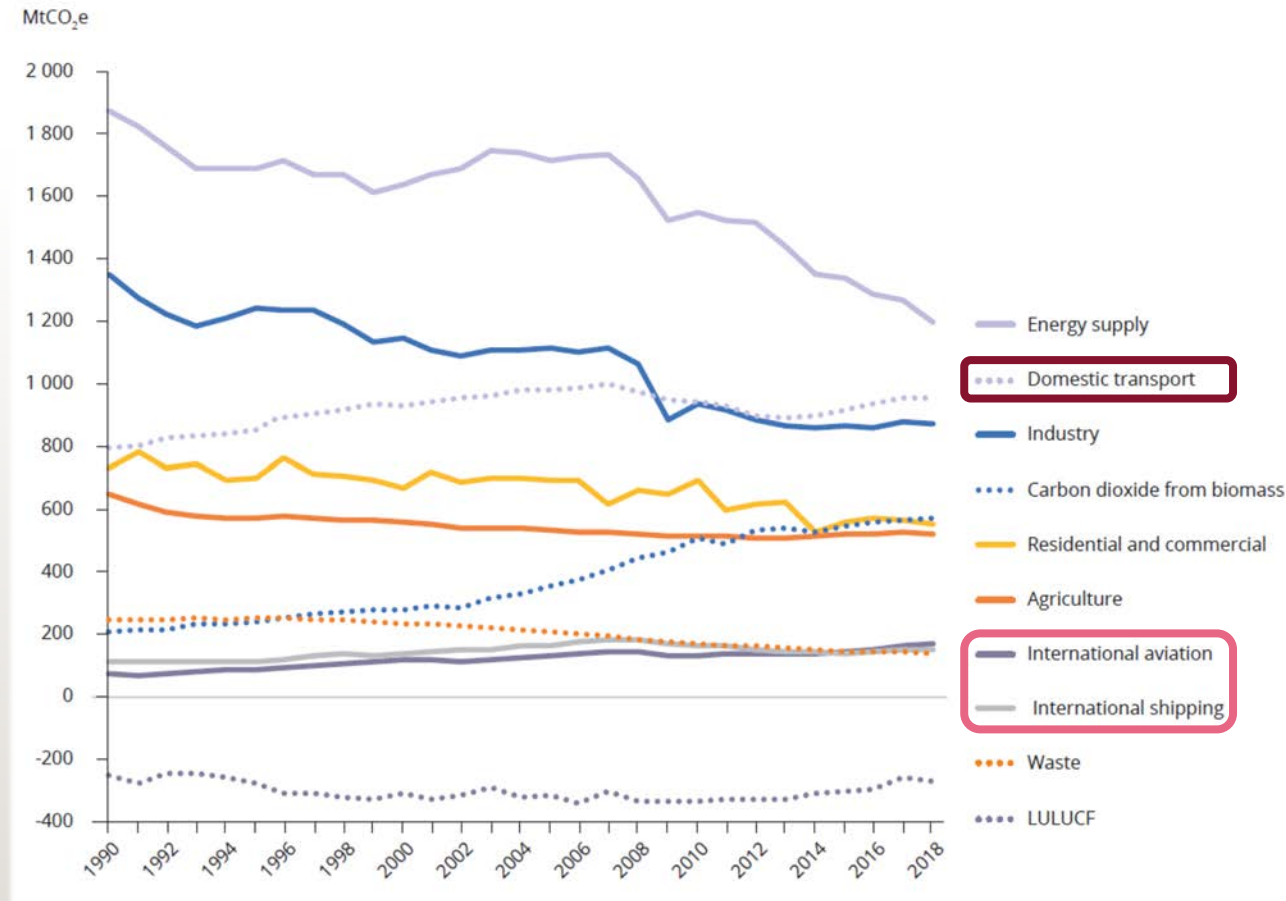
Source: UNFCCC (2015)

his protection in parts (EU-27), ...



Source: EEA (2020)

his vulnerable heel, and ...



+172 m t CO₂e

Source: www.bijmans.nl (Jul 14, 2020)

Source: EEA (2020)

Achilles' death



Source: www.mercurynews.com



Source: www.wetter.de



One possible treatment!

Cap-and-trade ...



Source: www

**“If it is feasible to establish a market to implement a policy,
no policy-maker can afford to do without one. ...
Unless I am very much mistaken,
markets can be used to implement any anti-pollution policy
that you or I can dream up”.**

John H. Dales 1968

... allows for decision prioritization,



meet | discover | track | act | join | give

The Daly News | Steady State Commentary and Related News

Top 10 Policies for a Steady-State Economy

October 28, 2013 / 20 Comments /

by Herman Daly



Let's get specific. Here are ten policies for ending [uneconomic growth](#) and moving to a steady-state economy. A steady-state economy is one that develops qualitatively (by improvement in science, technology, and ethics) without growing quantitatively in physical dimensions; it lives on a diet — a constant metabolic flow of resources from depletion to pollution (the entropic throughput) maintained at a level that is both sufficient for a good life and within the assimilative and regenerative capacities of the containing ecosystem.

Ten is an arbitrary number — just a way to get specific and challenge others to suggest improvements. Although the whole package here discussed fits together in the sense that some policies supplement and balance others, most of them could be adopted singly and gradually.

1. Cap-auction-trade systems for basic resources Caps limit biophysical scale by quotas on depletion or pollution, whichever is more limiting.

Auctioning the quotas captures scarcity rents for equitable redistribution. Trade allows efficient allocation to highest uses. This policy has the advantage

Source: www.steadystate.org

“The **cap** serves the goal of sustainable **scale**; the **auction** serves the goal of fair **distribution**; and **trading** allows efficient **allocation** — three goals, three policy instruments”
(Daly 2019)

Ecological Economics, 6 (1992) 185–193
Elsevier Science Publishers B.V., Amsterdam

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Commentary

Allocation, distribution, and scale: towards an economics that is efficient, just, and sustainable

Herman E. Daly ¹

Environment Department, World Bank, Washington, DC, USA

(Received 14 December 1991; accepted 17 April 1992)

... can be made sustainable,

	Sustainable Design
Coverage	mandatory participation all GHG (based on CO ₂ e) all polluters
Cap	-25-40% by 2020, -50-65 % by 2030 (base 1990) absolute volume cap ("Budget Approach") gradual cap reduction ("Contraction & Convergence")
Allocation	unit of 1 metric t of CO ₂ e/a 100% auctioning frequent, non-discriminatory auctions equally accessible primary and secondary markets
Revenue Use	100% revenue recycling earmarked to equal per capita dividend
Flexibility Mechanisms	unlimited banking no borrowing offsets limited to "Gold Standard" projects
Price Management	price floor (\geq SC-CO ₂ , i.e. 50/60 US\$/t in 2020/2030) price ceiling (\geq 2°C target achievement cost, i.e. 80/100 US\$/t in 2020/2030)
Compliance	control periods not longer than 3 years continuous emission monitoring or annual third-party verified reporting emission and allowance tracking and registration fines for non-compliance ($> p$) compensation of excess emissions
Supporting Measures	border adjustment linking

Source: Rudolph et al. (2012)

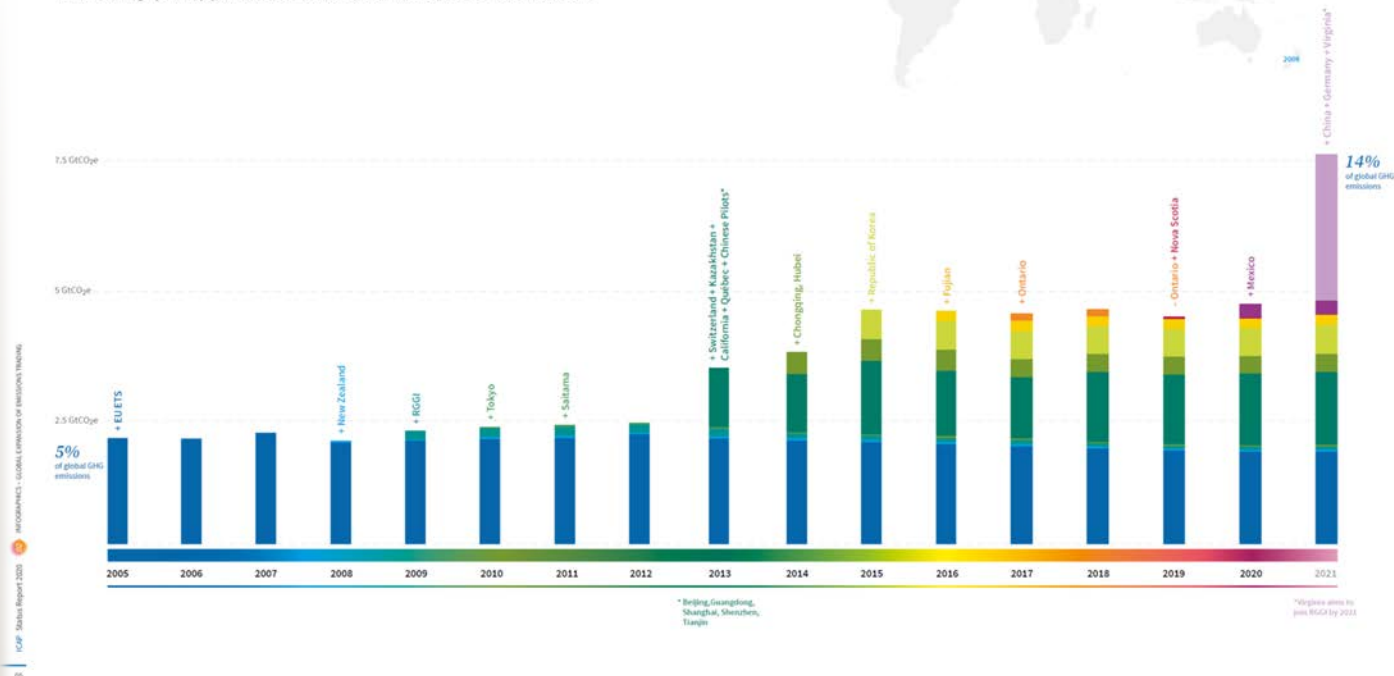
Source: www.bijmans.nl (Jul 14, 2020)

... has been spreading globally!

GLOBAL EXPANSION OF EMISSIONS TRADING

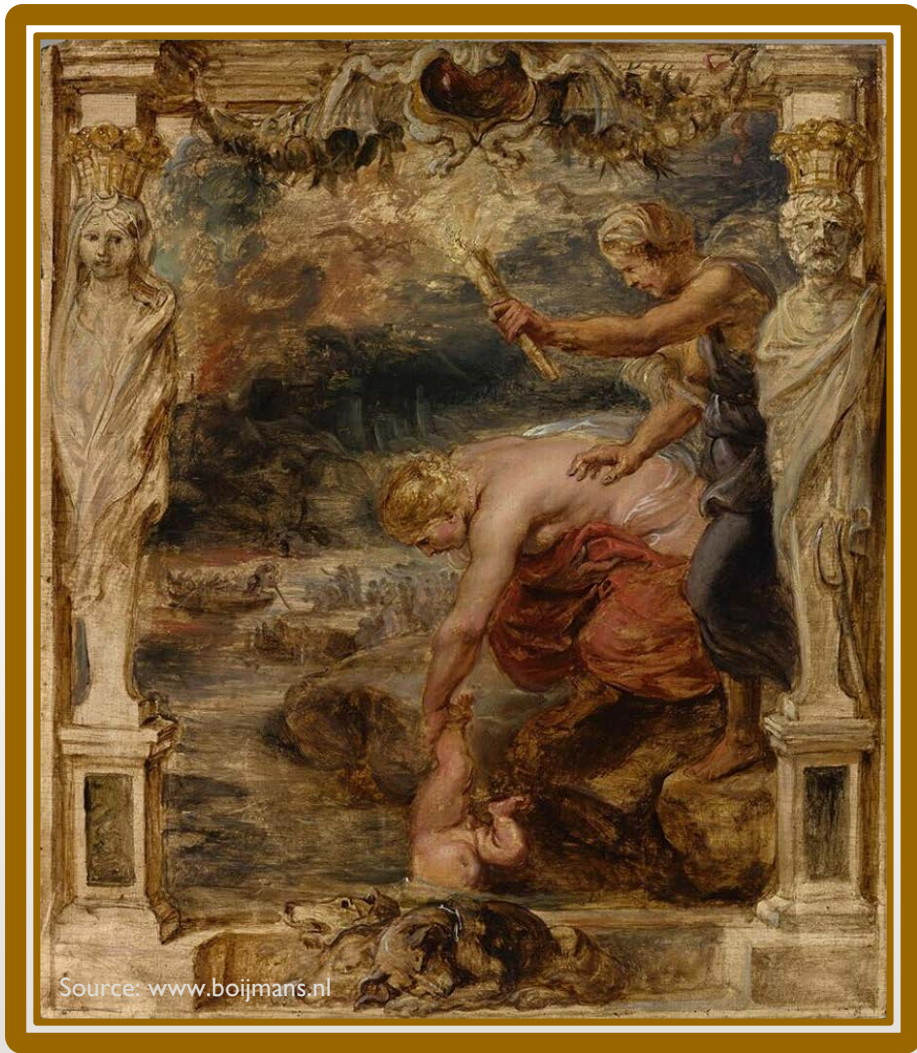
GHG emissions under ETSS

The graphic depicts the worldwide growth of emissions trading over time. Systems are spreading around the world and new additions will soon triple the share of global GHG emissions covered by emissions trading since the launch of the EU ETS in 2005. Changes over time are driven by the addition of new sectors and systems, as well as by the counteracting trend of declining caps in many systems. See the section titled "Notes on Methods and Sources" for additional details.



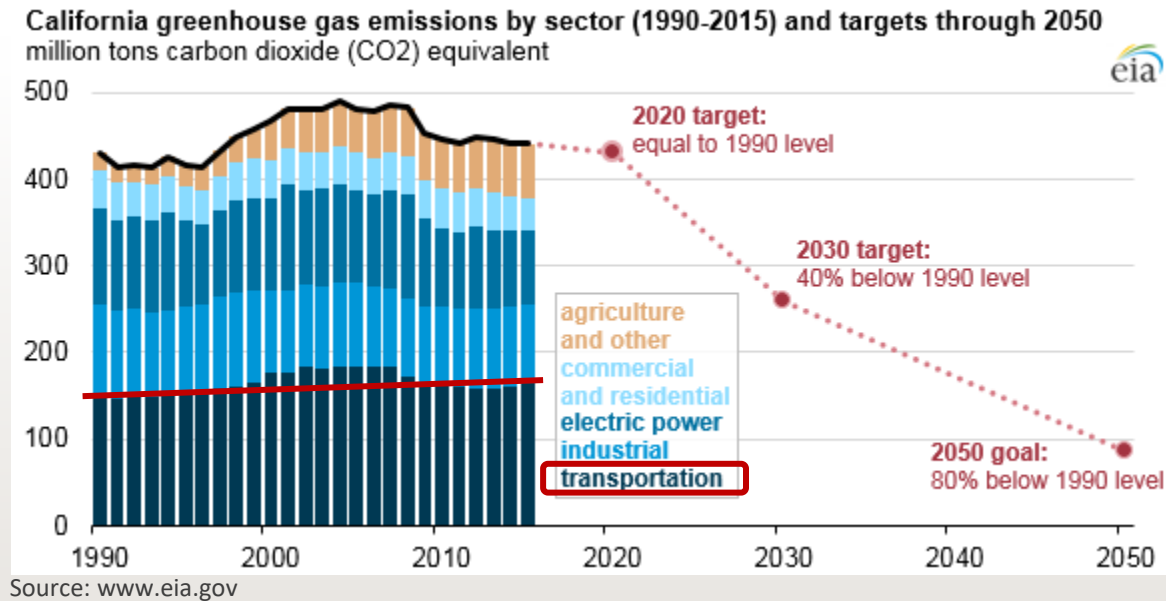
Source: www.bijmans.nl (Jul 14, 2020)

Source: www.icapcarbonaction.com



Really the cure?

California's Achilles Heel





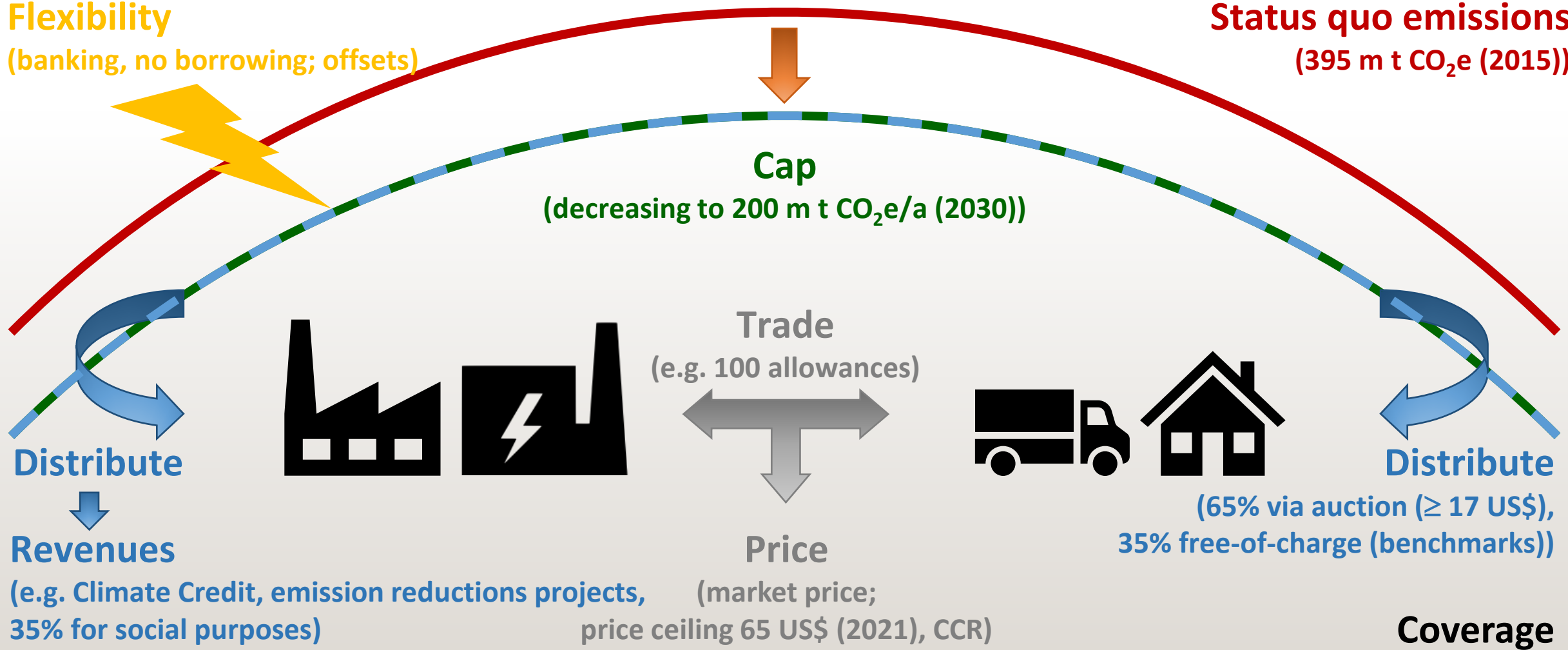
The Californian treatment (CalCaT)

Flexibility

(banking, no borrowing; offsets)

Status quo emissions

(395 m t CO₂e (2015))



Distribute

Revenues

(e.g. Climate Credit, emission reductions projects, 35% for social purposes)

Trade
(e.g. 100 allowances)

Price

(market price; price ceiling 65 US\$ (2021), CCR)



Distribute

(65% via auction (≥ 17 US\$), 35% free-of-charge (benchmarks))

Coverage

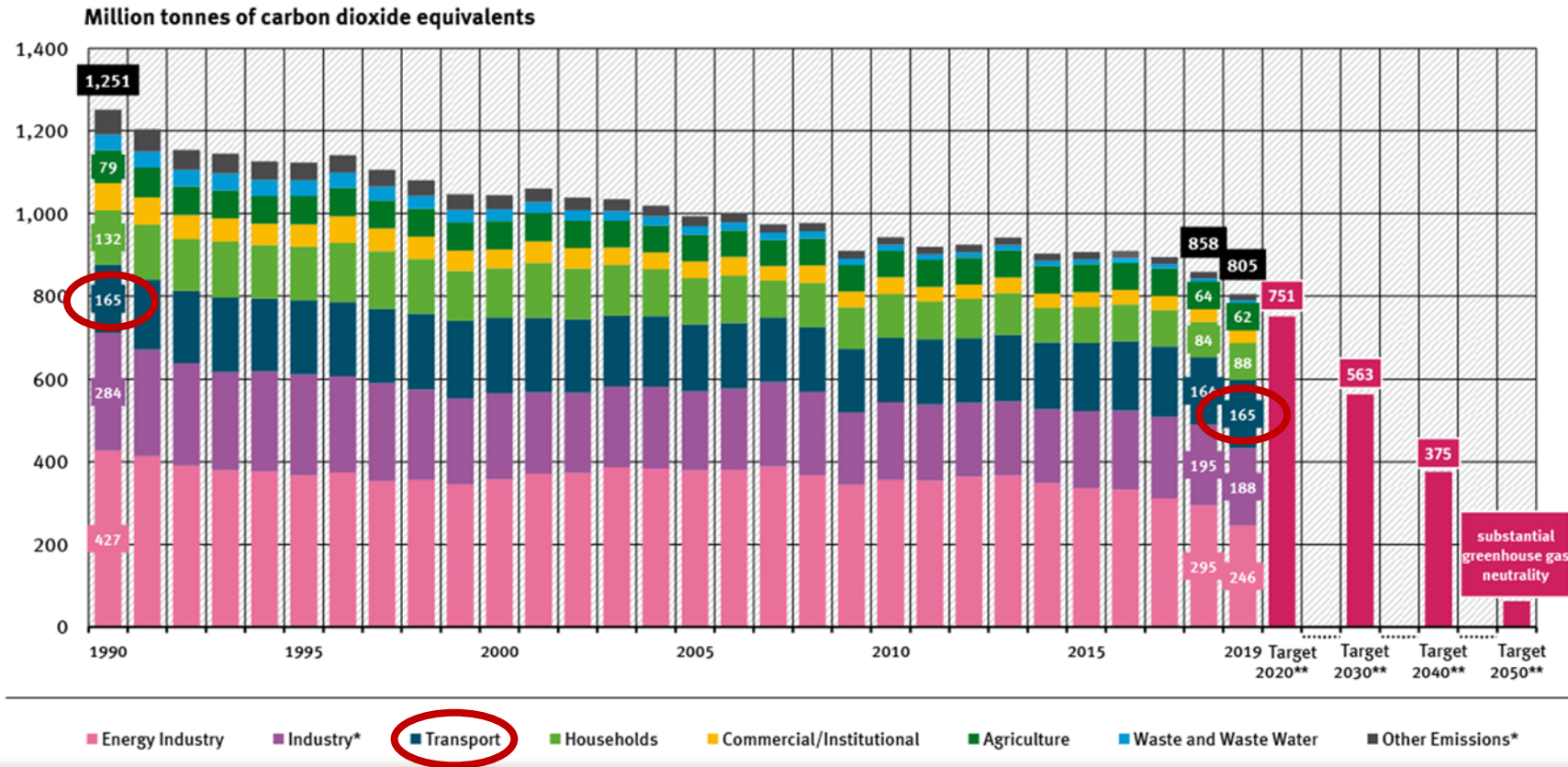
(industry and utilities downstream since 2013, transport and heating fuels upstream since 2015)

CalCaT's healing success

	AB32/SB32	CalCaT
GHG transport sector 2017 (from 2012 levels)	+ 5 %	
GHG total 2017 (from 1990 levels)	- 6 m t	
GHG goals 2020/30 (from 1990 levels)	0 / 40 %	- 13 / 47 %
Compliance 2013-2020		≈ 100 %
CO ₂ e price		12-18 US\$ / t
GDP	- 2.2 to + 1.1 %	
Net benefits California in 2030		- 4.6 to + 4.9 bn US\$
Net benefits Inland Empire 2016-2020		+ 0.150 bn US\$
Net benefits Inland Empire 2017-2030		-0.3 to +4.8 bn US\$
Revenue share benefitting low-income households by 2019	57 %	
Net effect high/low-income households in 2020	+ 500/400 US\$ / a	
Net effect low-income households in 2030	+ 115 to 280 US\$ / a	

Germany's Achilles Heel

Emission of greenhouse gases covered by the UN Framework Convention on Climate



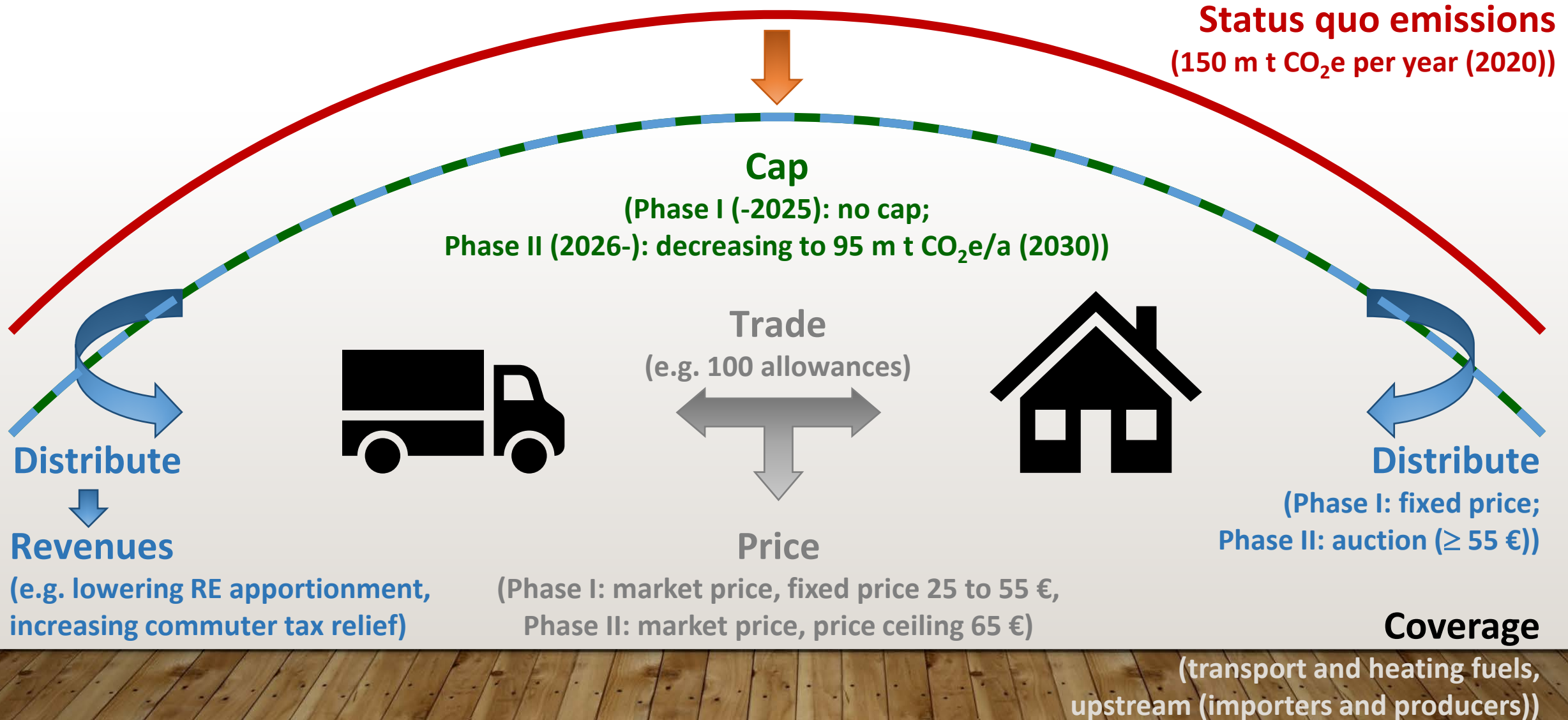
Source: www.umweltbundesamt.de

The German treatment (sector target roadmap)

Annual emission budgets in millions of tonnes of CO ₂ equivalent	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Energy	280		257								175
Industry	186	182	177	172	168	163	158	154	149	145	140
Buildings	118	113	108	103	99	94	89	84	80	75	70
Transport	150	145	139	134	128	123	117	112	106	101	95
Agriculture	70	68	67	66	65	64	63	61	60	59	58
Waste and Other	9	9	8	8	7	7	7	6	6	5	5

Source: BMU (2019)

The German treatment (F-ETS)



German F-ETS' healing promise

	Sep 2019 draft	Dec 2019 draft
GHG reduction total in 2021	1.5 m t	3.4 m t
GHG reduction total in 2030	28.5 m t	25.0 m t
GHG reductions transport 2030	17.1 m t	18.5 m t
GHG reductions buildings 2030	12.5 m t	13.5 m t
Government annual revenues 2026	12.2 bn €	15.6 bn €
net income burden average	0.7 %	0.4 %
net income burden in low-income households	1.0 %	0.5 %
net income burden on high-income households	0.4 %	0.3 %

Source: www.bijmans.nl

Source: table by authors based on DIW (2019, 2020)

Healing the Achilles Heel sustainably?

	Sustainable Design	DE F-ETS	CalCaT (F)
Coverage	mandatory participation all GHG (based on CO ₂ e) all polluters	● ● ●	● ● ●
Cap	-25-40% by 2020, -50-65 % by 2030 (base 1990) absolute volume cap ("Budget Approach") gradual cap reduction ("Contraction & Convergence")	● ● ● ● ●	● ● ●
Allocation	unit of 1 metric t of CO ₂ e/a 100% auctioning frequent, non-discriminatory auctions equally accessible primary and secondary markets	● ● ● ● ● ● ● ●	● ● ● ●
Revenue Use	100% revenue recycling earmarked to equal per capita dividend	● ●	● ●
Flexibility Mechanisms	unlimited banking no borrowing offsets limited to "Gold Standard" projects	● ● ● ●	● ● ●
Price Management	price floor (≥ SC-CO ₂ , i.e. 50/60 US\$/t in 2020/2030) price ceiling (≥ 2°C target achievement cost, i.e. 80/100 US\$/t in 2020/2030)	● ●	● ●
Compliance	control periods not longer than 3 years continuous emission monitoring or annual third-party verified reporting emission and allowance tracking and registration fines for non-compliance (> p) compensation of excess emissions	● ● ● ● ●	● ● ● ● ●
Supporting Measures	border adjustment linking	● ●	● ●

Healing the Achilles Heel!

California pioneered multi-sector cap-and-trade incl. transport!

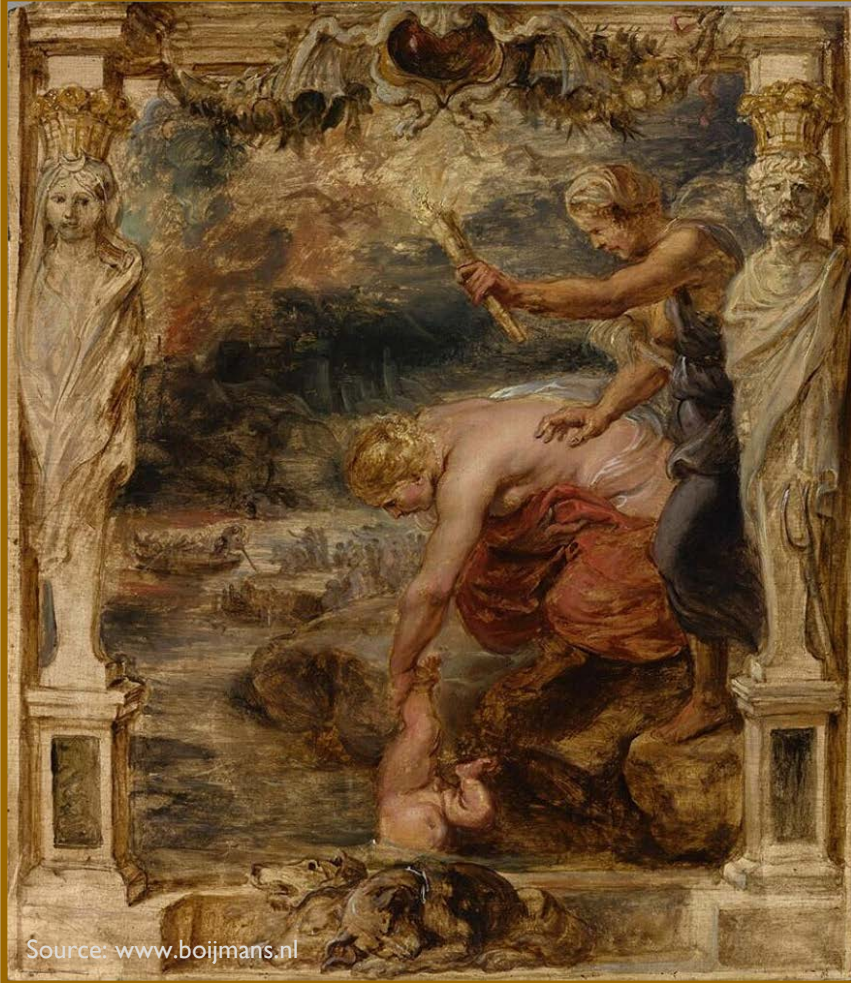
- + sustainable design except for price collar, offsets(, cap)
- + cost-efficiency, regressivity prevention (via revenue use)
- transport emission increase, low CO₂e price

The new German Fuels-ETS is promising, ...

- + sustainable design except for revenue use, “tax” approach, price ceiling
- + transport emission reductions, high CO₂e price
- cost-efficiency losses, insufficient regressivity prevention (via revenue use)

but could be made more sustainable by three major revisions!

- ⇒ replacing the price escalator by a cap in line with the sector target
- ⇒ removing the price ceiling and raising the price floor to ≥ 100 US\$ (2030)
- ⇒ earmarking all revenues to an equal per capita climate dividend



Source: www.boijmans.nl

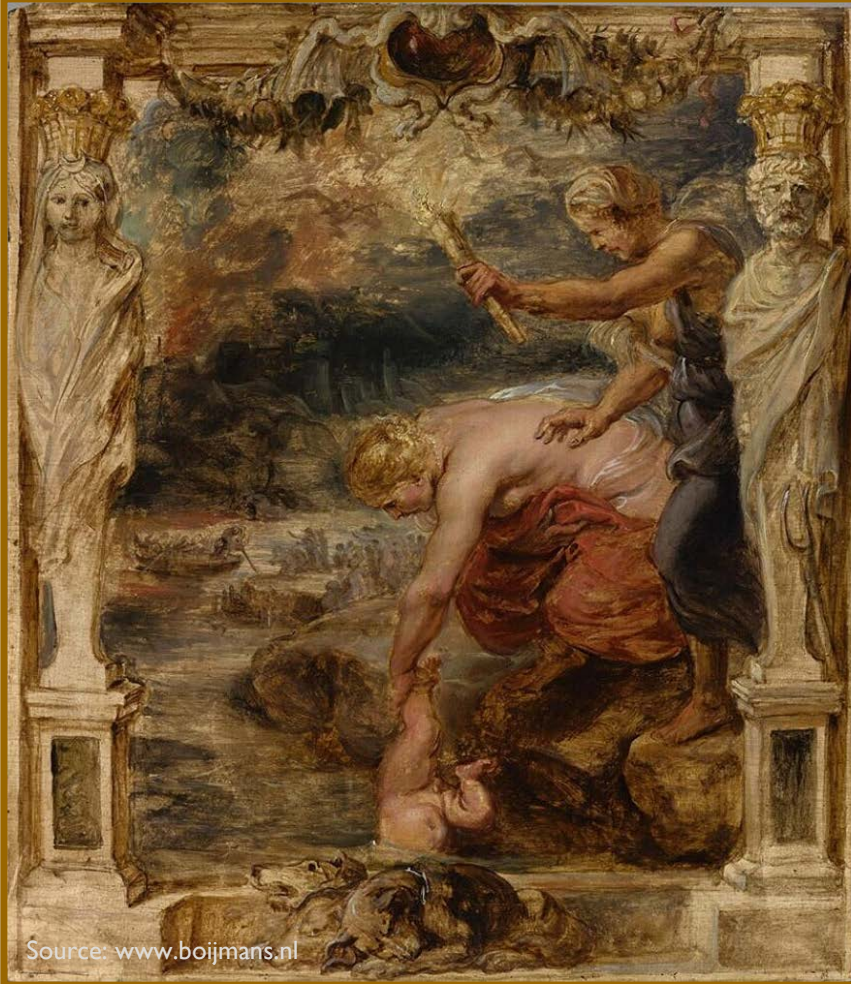
An alternative cure!

The transport sector could be included in the EU ETS!

- + cost-efficiency, reduction of allowance surplus
- reduction obligation shift to other sectors
- extra burden for low-income households, if not compensated

Still, a truly sustainable design could be a remedy!

- ⇒ price collar from SC-CO₂ to Paris Agreement Achievement Costs
- ⇒ full auctioning with revenue earmarked to climate dividend
- ⇒ border carbon price adjustment



If well dosed,
sustainable cap-and-trade
can heal Climate Policy's Achilles Heel and
prevent the fatal wound!

