

Neither the rock nor the hard place: balancing the politics and the economics of emissions control

Public lecture by

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I hope to persuade you of the following:

- Tradable emission permits and emission taxes – “**market mechanisms**” – have **big advantages** over other policies for controlling environmental damage of some kinds.
- With each mechanism, the type that’s **politically most acceptable** to powerful interest groups (the “rock”) is at an **opposite** extreme to the type which gives **most economic welfare** to society as a whole (the “hard place”).

- To make **permits balanced**, that is:
 - (just) politically acceptable, and yet also
 - yielding “good” improvements in economic welfare,

it is vital to choose neither the rock nor the hard place, by giving away **some but not all permits free** to those who currently benefit from emissions.

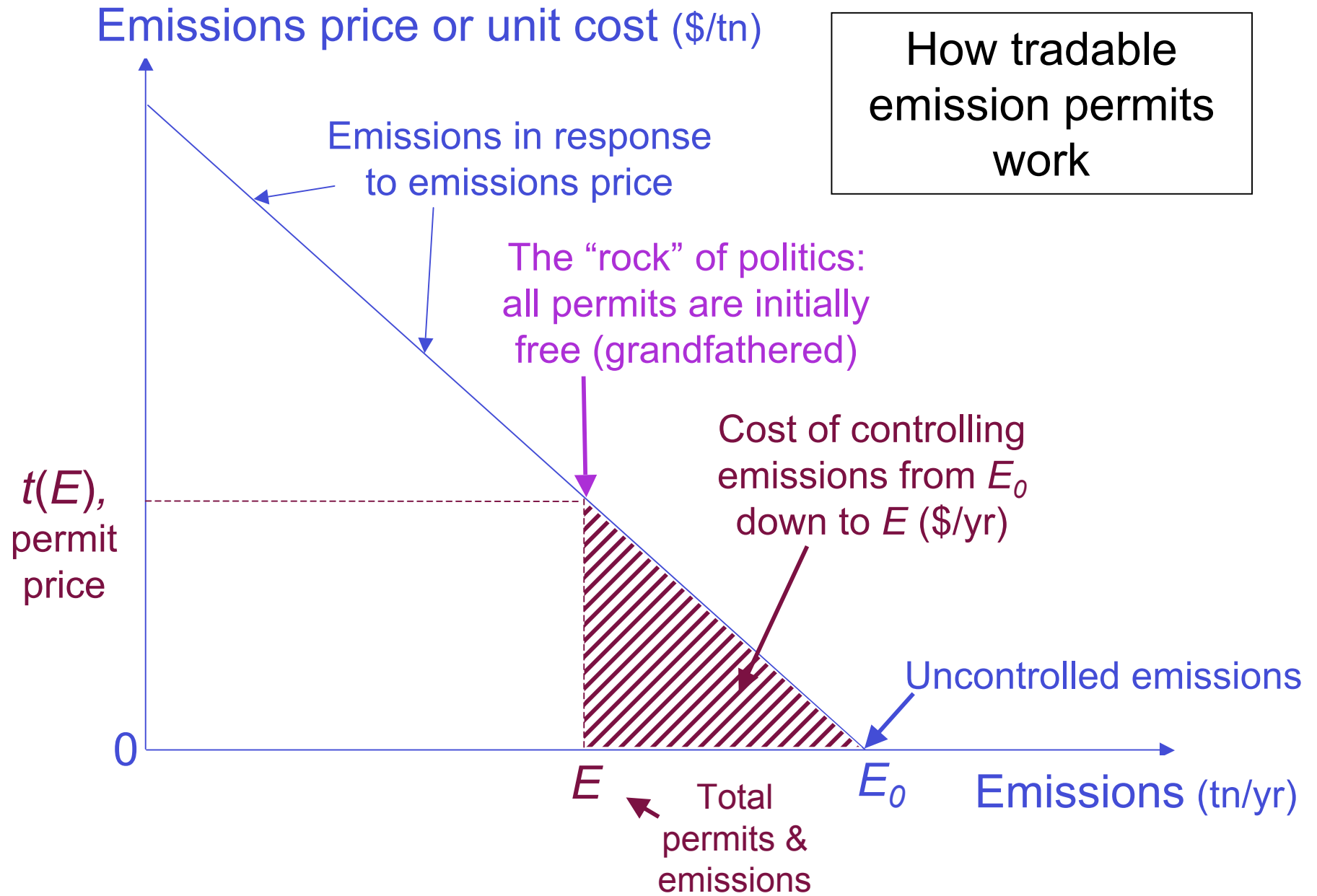
- To make **a tax** both politically acceptable and yield good economic welfare, it is vital to give away **thresholds to exempt some but not all emissions** from taxes.

Main application here is control of greenhouse gases, especially CO₂ from fossil fuel burning in rich countries like Australia/NZ...

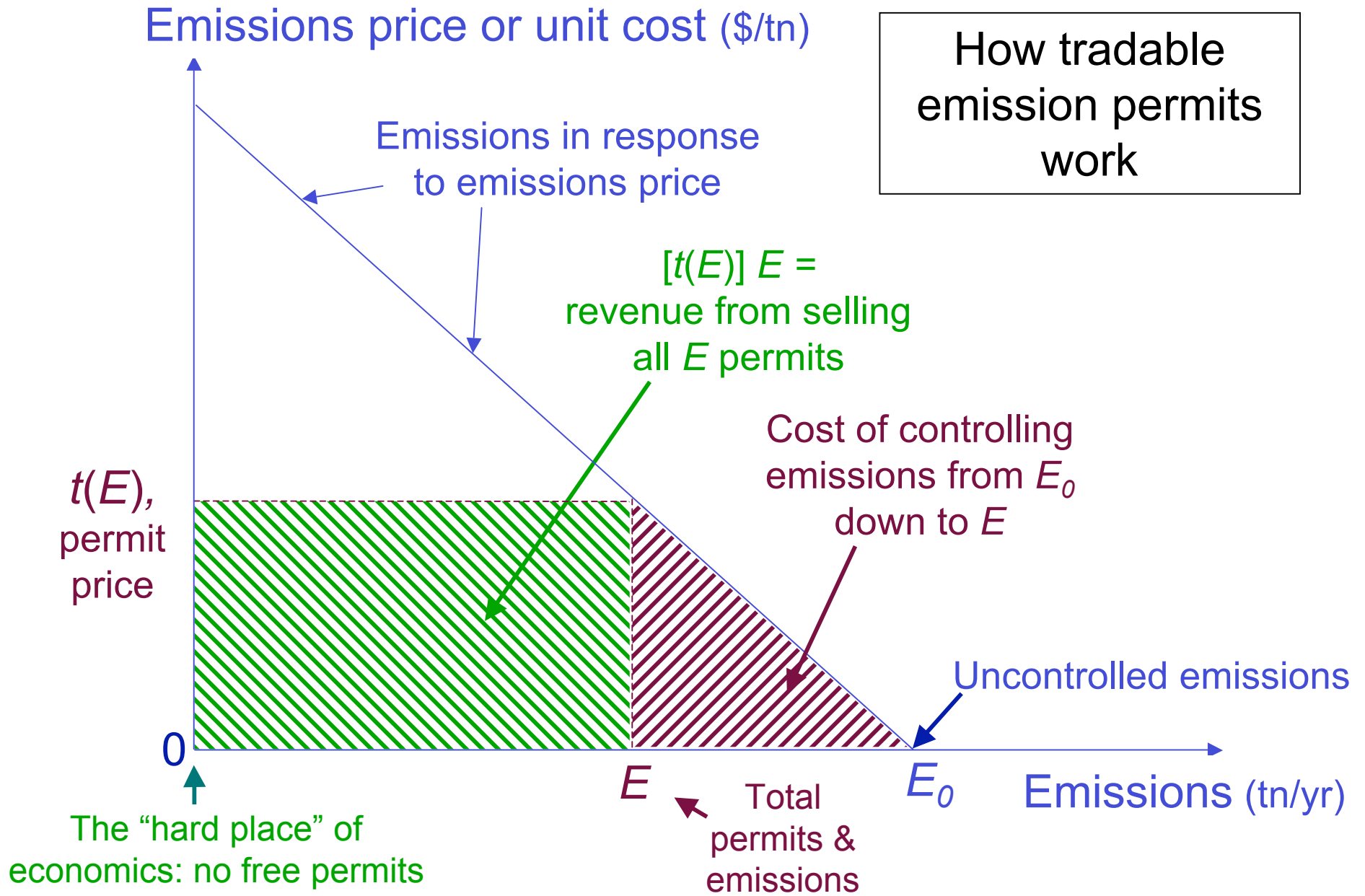
...but also relevant to politics vs economics of other emissions control (e.g. SO₂), and to raising commodity prices to reflect scarcity, e.g. for **water**

However, first set out simplest idea of “balance between the rock and the hard place”. Make many assumptions discussed more later, such as:

- emissions need to be cut
- market mechanisms will be used
- no time dimension; so what follows includes many dynamic schemes, e.g. initially free permits which are then phased out



How tradable emission permits work

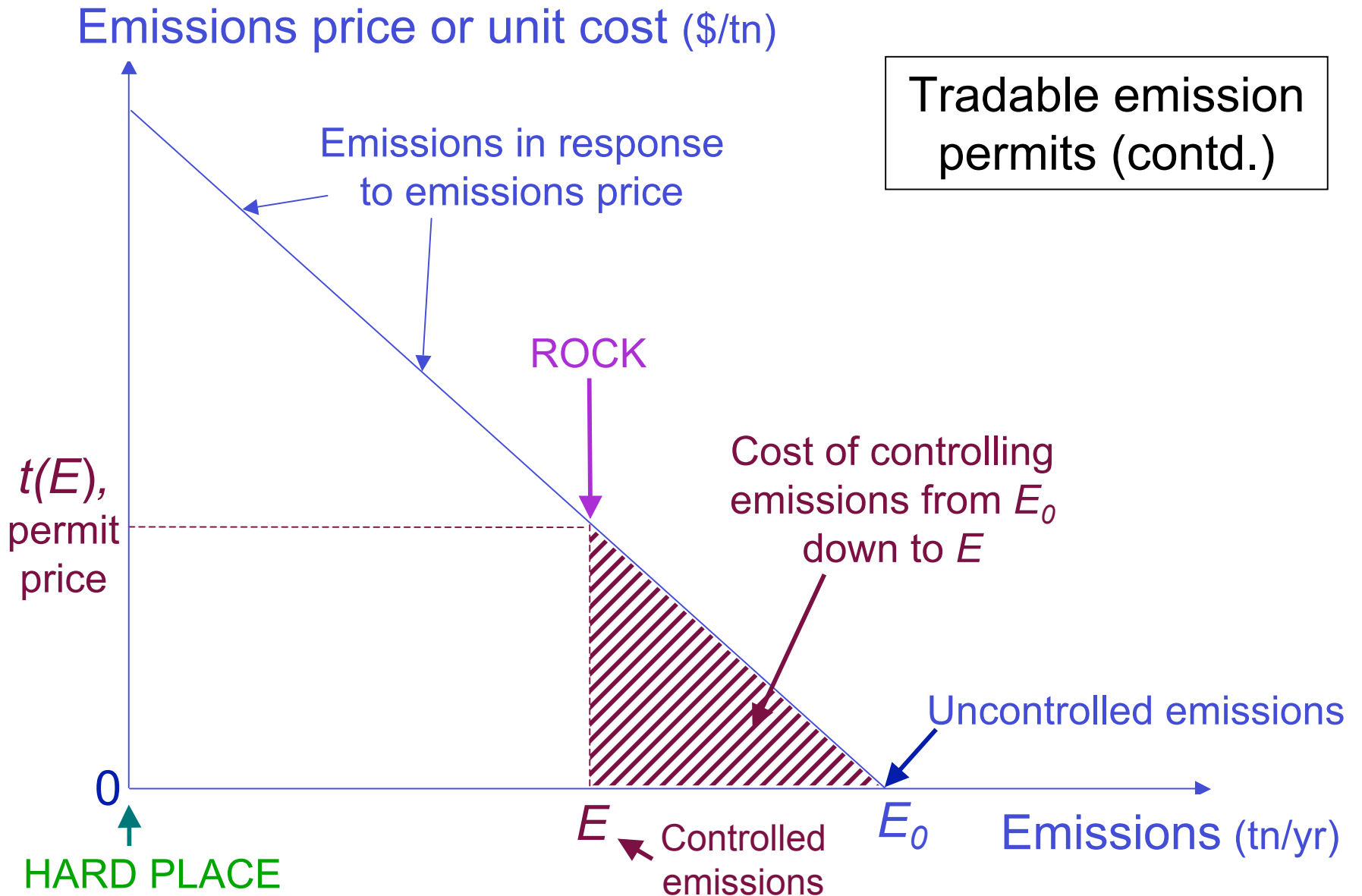


Why are no free permits *better* for the economy?

- Because of **tax interaction (TI)**. Raising **\$1 of revenue** from existing (labour) income tax & other taxes has extra **“deadweight” (distortionary) cost of \$M**, mainly because of reduced labour supply. $M > 0.3$?
- Hence \$1 revenue from market mechanism allows **“revenue-recycling benefit”** of at least 30c, e.g. by reducing income tax rate; hence economists’ “hard place” recommendation to **sell all** permits.

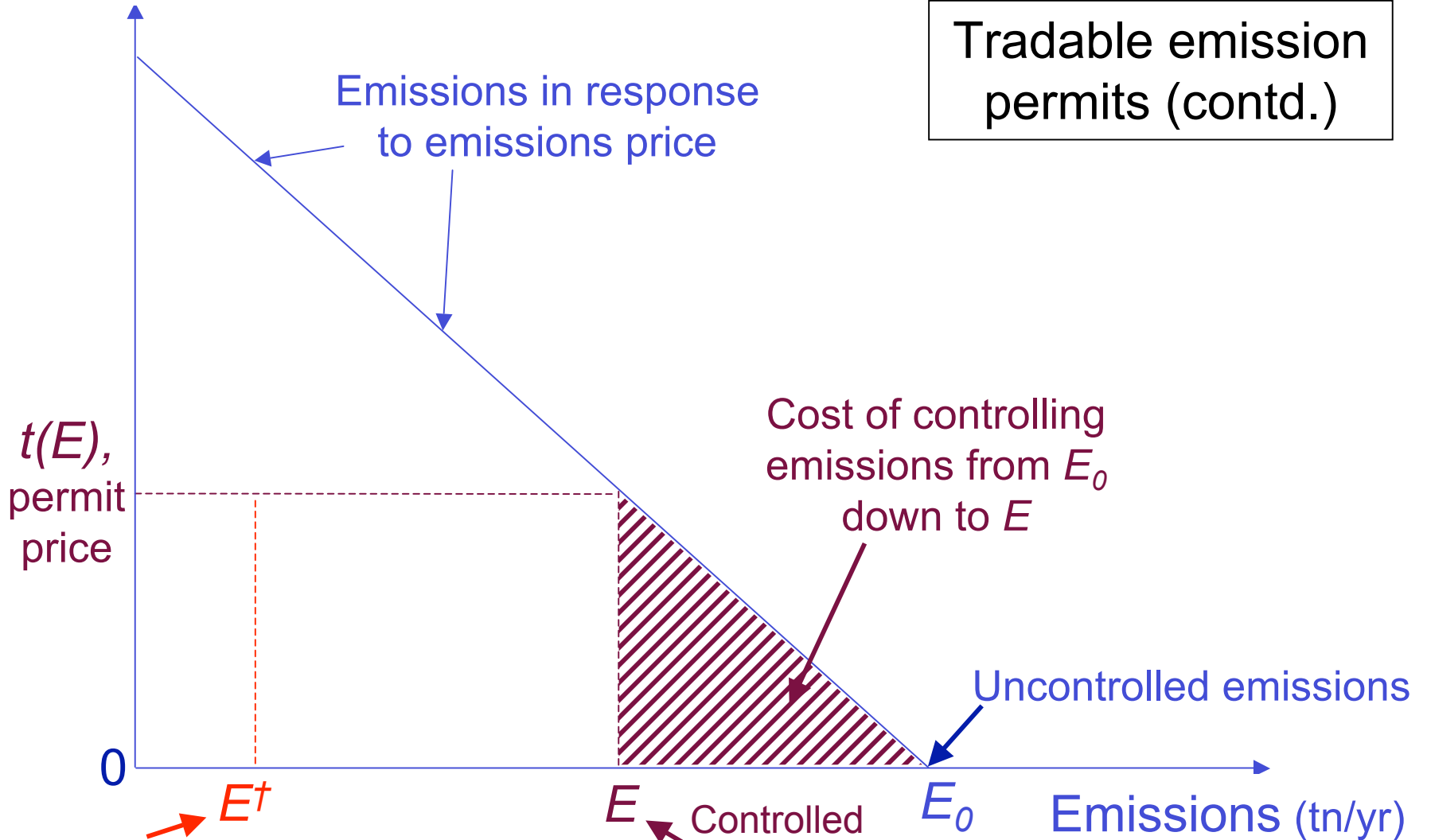
Why are no free permits *fairer* than all free permits?

- Because emissions control may reduce output, raise output price and give emitters **extra profits**.
- Important for GHGs: maybe “equity-neutrality” for firms needs **only 10-30% of permits to be free** – deserves wider publicity to shift political reality.



Emissions price or unit cost (\$/tn)

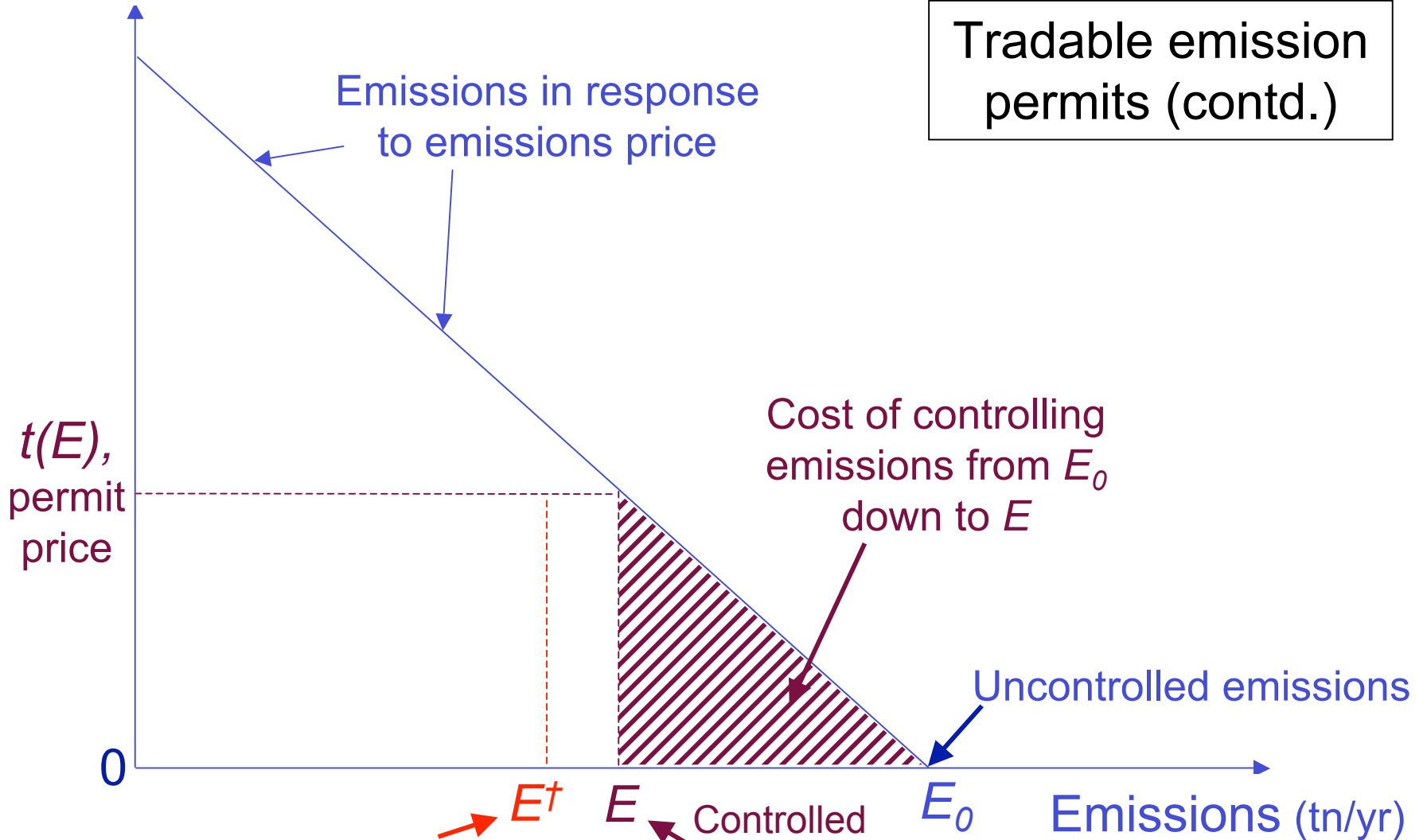
Tradable emission permits (contd.)



Balancing economics and politics with free permits E^t between 0 and E

Emissions price or unit cost (\$/tn)

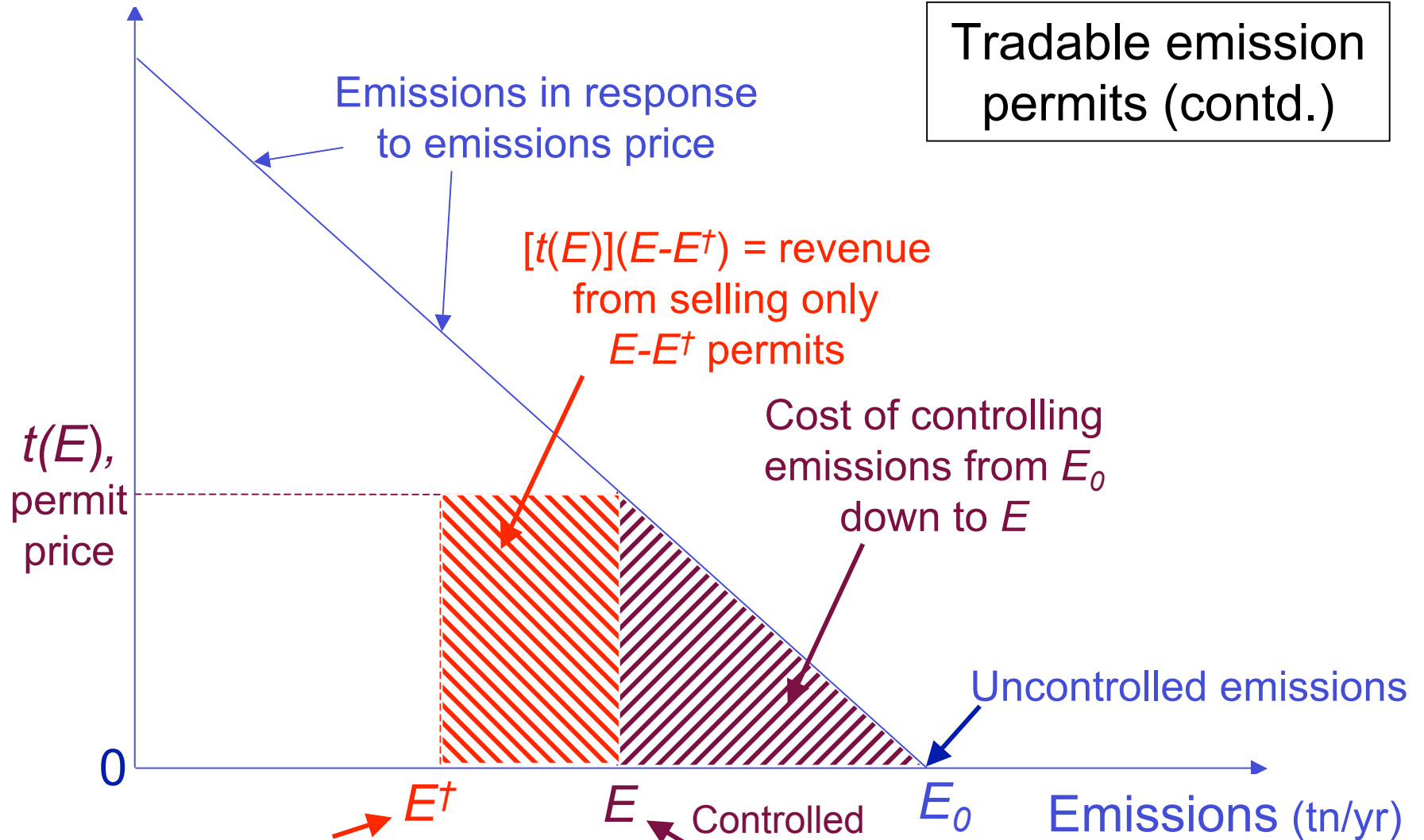
Tradable emission permits (contd.)



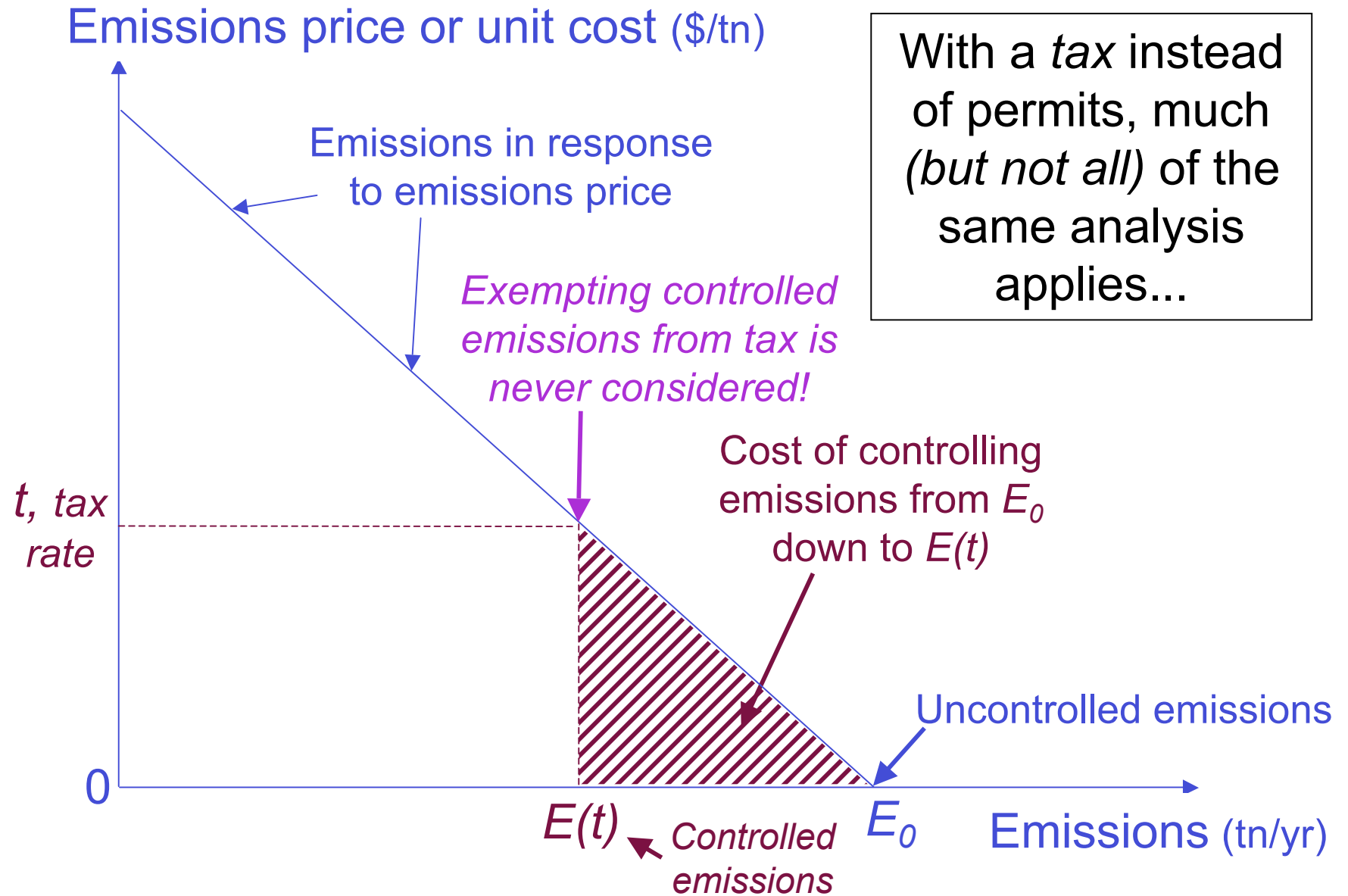
Balancing economics and politics with free permits E^t between 0 and E

Emissions price or unit cost (\$/tn)

Tradable emission permits (contd.)



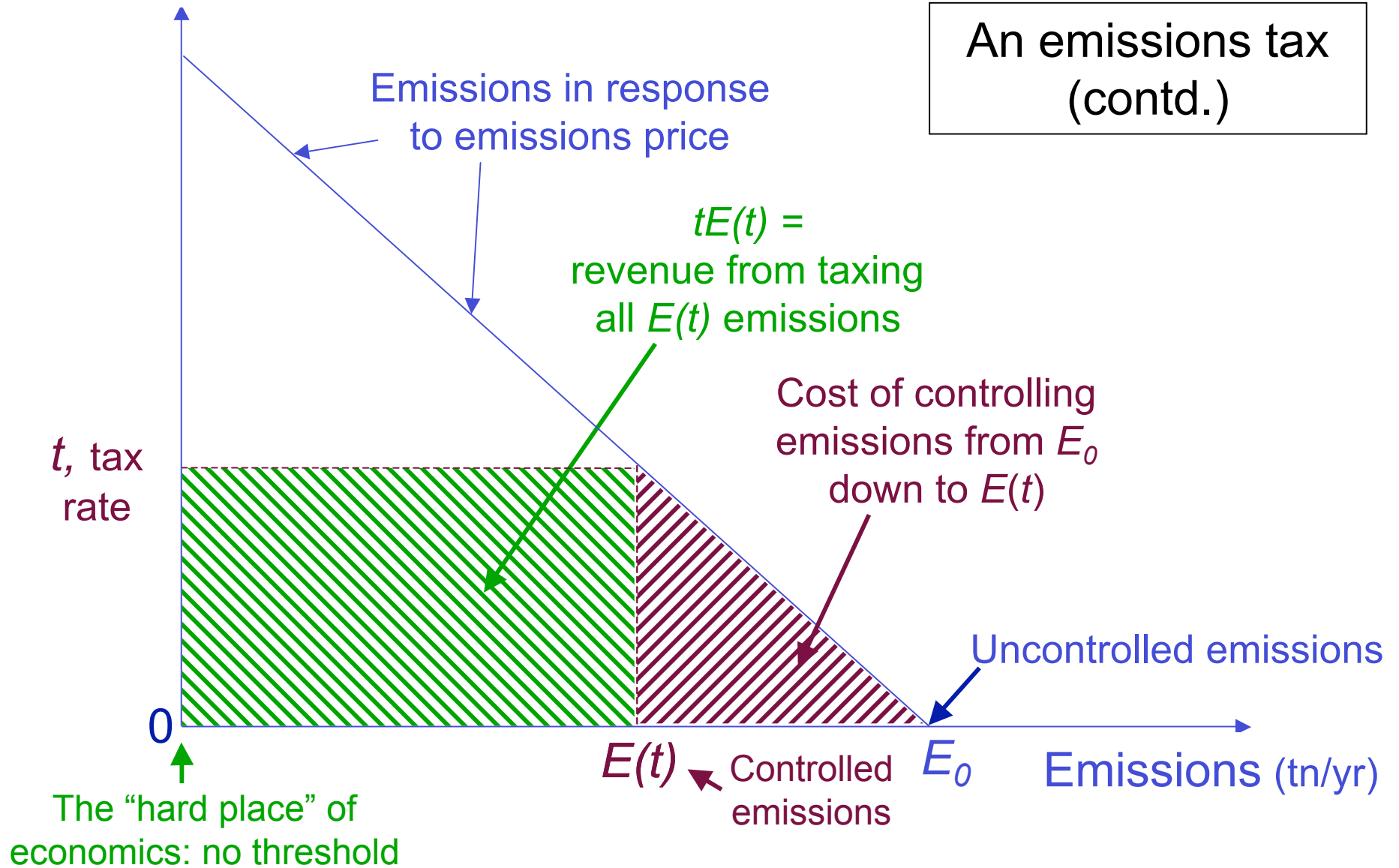
Balancing economics and politics with free permits E^+ between 0 and E



With a *tax* instead of permits, much (*but not all*) of the same analysis applies...

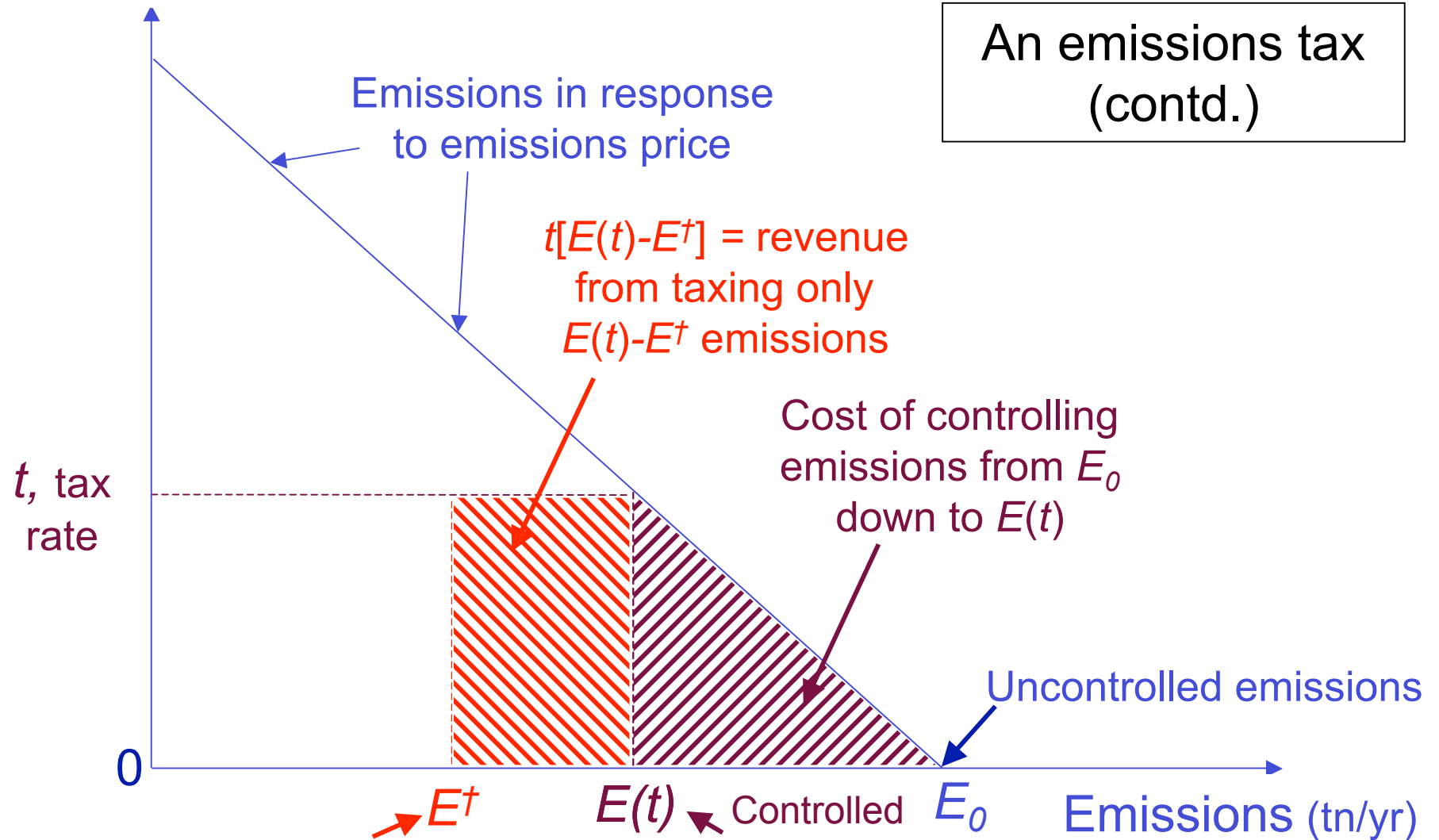
Emissions price or unit cost (\$/tn)

An emissions tax
(contd.)



Emissions price or unit cost (\$/tn)

An emissions tax
(contd.)



Balancing economics and politics with a threshold E^t between 0 and $E(t)$ – **to be distributed just like free permits**

What might an emission tax threshold “look” like?

*Anyland Government
The Treasury*

EMISSION TAX THRESHOLD
for 5,000 tonnes/year of CO₂-equivalent

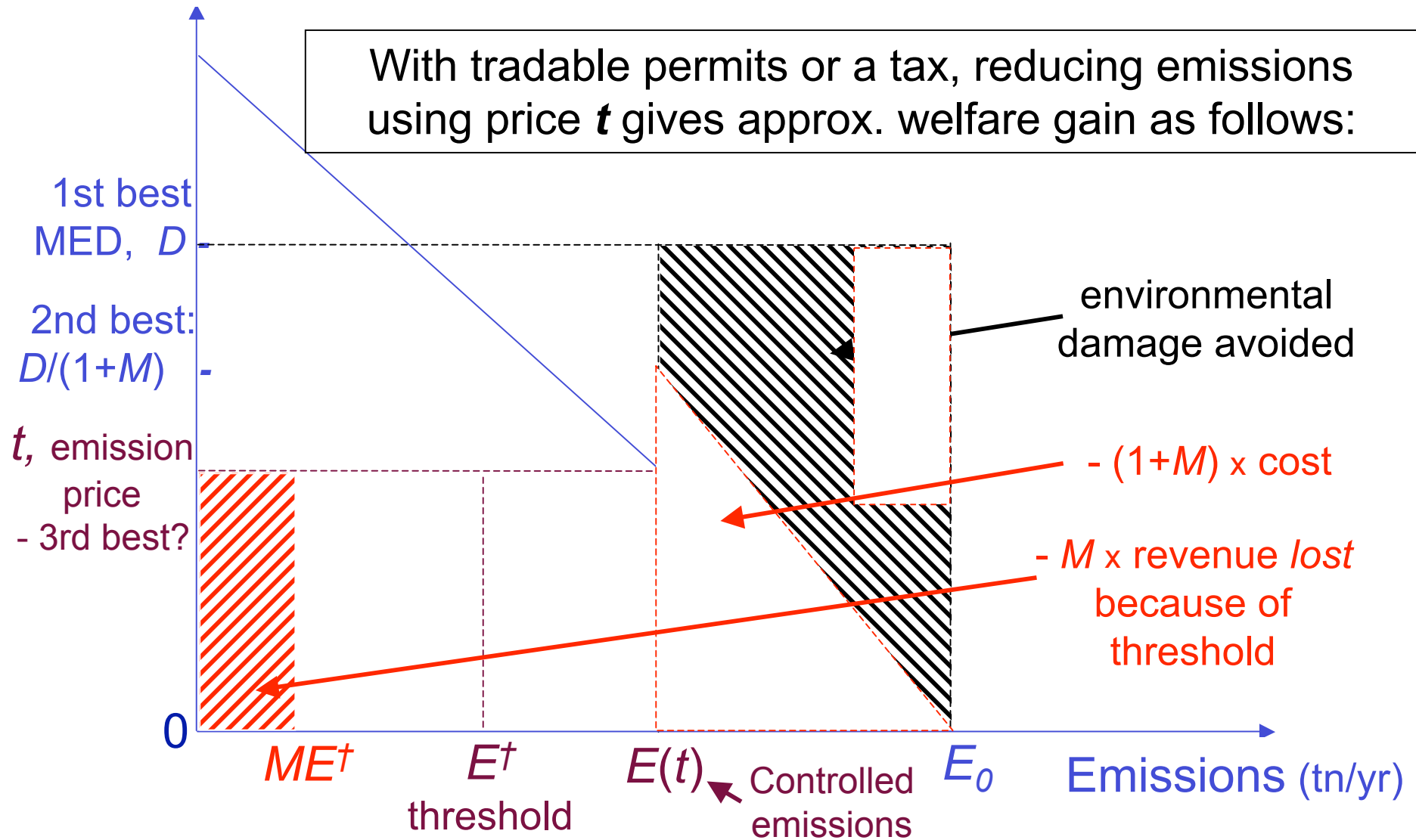
The Anyland Government will pay the bearer, on 1 July each year forever, a sum equal to 5,000 tonnes/year, multiplied by the CO₂ tax rate in \$/tonne set for that year by the Anyland Environmental Protection Agency

If this threshold idea is vital to make a tax acceptable, but is widely ignored, why bother with a tax at all?

- **Permits** control emissions quantity but leave **price uncertain**. **A tax** controls emissions price but leaves **quantity uncertain**.
- If society suffers more from price uncertainty cost to emitters than from quantity uncertainty cost to environment, a tax is better than permits (Weitzman 1974)
- With **CO₂**, one year's emission quantity has negligible effect on environment, because of huge concentration already in atmosphere; so quantity uncertainty not v. costly.
- So with CO₂, **tax has considerable economic advantage** (Pizer 2002, and promoted by McKibbin 2005 and earlier)

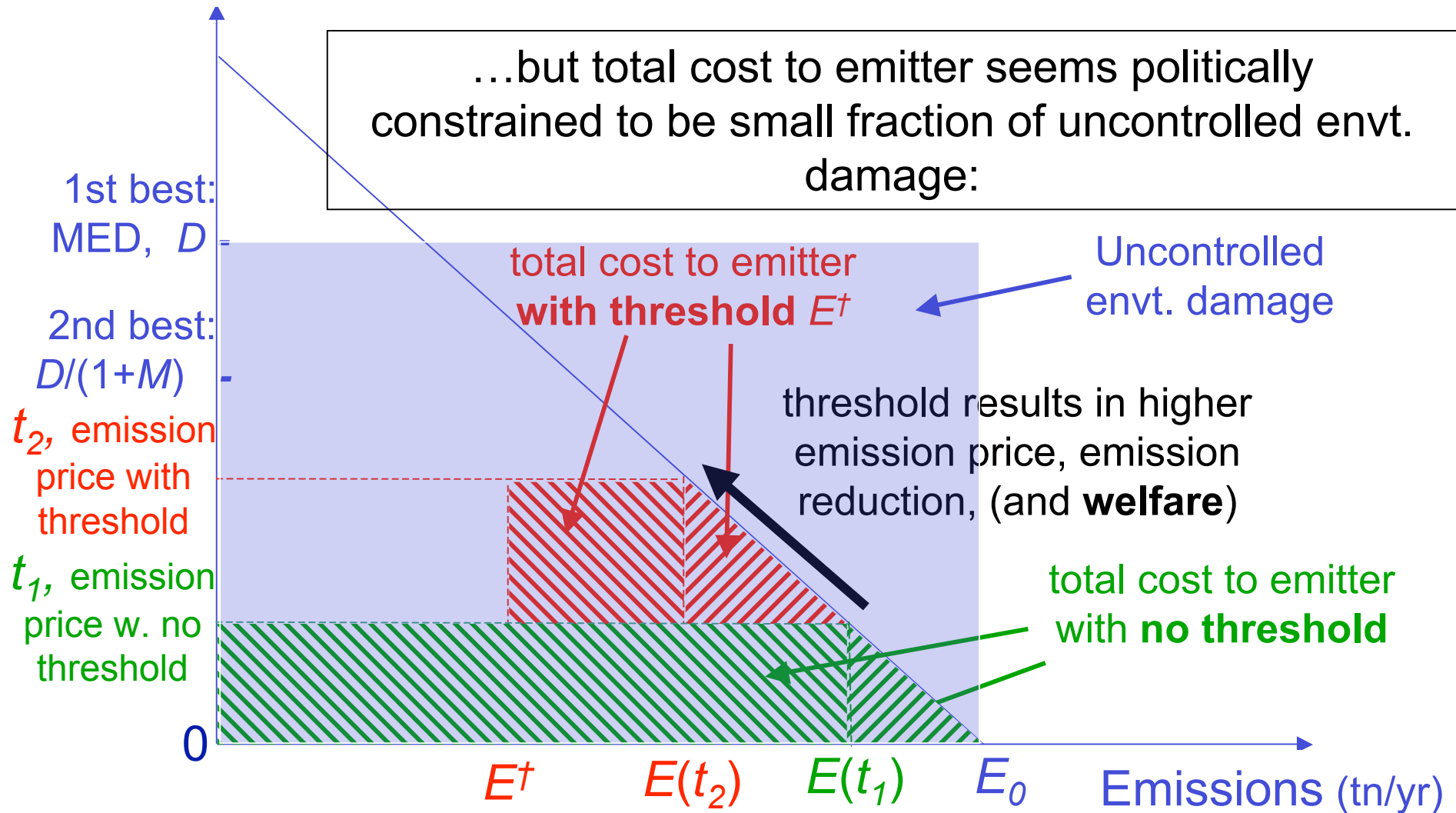
Emissions price or unit cost (\$/tn)

With tradable permits or a tax, reducing emissions using price t gives approx. welfare gain as follows:



Emissions price or unit cost (\$/tn)

...but total cost to emitter seems politically constrained to be small fraction of uncontrolled envt. damage:



How big can this welfare gain from thresholds be?

Example: deadweight factor $M = 0.3$: constraint that total cost to emitters can be max. 20% of uncontrolled environmental damage DE_0

	No threshold / free permits	Optimal threshold / free permits	Full threshold / free permits
$t/D =$ emission price / MED, as %	21	50	82
$E/E_0 =$ controlled/original emissions, as %	87	70	51
$E^t/E =$ threshold / controlled emissions, as %	0	64	100
welfare gain from emissions control, \$m	329 ("best", 692, is unacceptable)	405 ("good")	315

Evidence for political constraint on revenue-raising

- **The CIA doesn't like pure emission taxes...**
...since 1972, the (UK) Chemical Industries Association argues that **since residual pollution (allowed by regulation) is “socially acceptable”, it should not be charged for.**
- **1990 US tradable permits for SO₂ : 97% given out free**
- **History of European CO₂ control policy, 1990s - date:**
 - early 1990s, **pure tax + full revenue-recycling proposed;** thresholds idea ignored
 - lobbying against pure tax + lack of EC power to tax forced **change to tradable permits**, which “can” be given free
 - hence permits **used in 1997 Kyoto Protocol** and 2005 EU Emission Trading Scheme; in latter many will be given free

NZ carbon tax provides further ongoing evidence....

...but first, do simplifying assumptions above fit the CO₂ case?

(1) Sizeable cuts in emissions are needed [assumed] - will not debate here, but CO₂ already higher than in last 650,000 years and rising 200x faster...

(2) Alternative policies to market mechanisms? [ignored]

(a) direct regulation (e.g. no new coal-fired power stations, mandated fuel efficiency standards for new vehicles)

(b) technology subsidies (e.g. for domestic solar panels, geosequestration of CO₂)

(c) information (persuasion, exhortation)

On their own, these alternative policies are either:

- **inefficient:** direct regulation and technology subsidies give very unequal unit (\$/tn) control costs, hence much higher total costs. Market mechanisms give equal unit costs (saved 25-35% for US SO₂ control, see Hahn 2000)

and/or

- **ineffective:** technology subsidies and information fail to get price message to emitters like you and me commuting long distances in 4WDs, flying round the world and living in big air-conditioned houses

However, *combined* with market mechanisms, above policies may be very important: even with big emission price, market failures are widespread; and politically smart to spend some permit/tax revenue on direct measures?

(3) International competition [ignored]

- Can free permits or thresholds protect **trade-sensitive, carbon-intensive industries** against unfair competition from **uncontrolled countries**?

It depends:

- If political resistance from such industries (which are often exempted from control - the very emitters that should be controlled!) can be bought off by transfer of **wealth**, then **Yes**.
- If political resistance stems from loss of **employment and output** needed to reduce emissions then **No** – no easy answer to latter (hence pressure for technological fixes).

(4) The time dimension [ignored]

- Emissions control last for many years.
- So govt can create **permanent** permits/thresholds (in tonnes/year, as above), or **temporary** ones (in tonnes).
- Hence many schemes for **phasing out** free permits/thresholds over time, or using mix of free permanent ones and auctioned temporary ones, etc, etc.
- Such schemes important psychologically: worth using.
- However, for all of them, **discounted value of free permits** can be calculated as % of discounted value of all permits - and that is my E^t/E ratio above. So phasing etc. schemes fall within my overall idea.

(5) Another time dimension [ignored]

- Because of adjustment costs, short-run control costs much higher than long-run.
- So don't jump to “optimum”, but **phase in emission price** - distinct from phasing out free permits, which do nothing to lower cost of actual control

(6) Spatial variation [ignored]

- Emissions may have different environmental impacts, depending where they come from
- Hence analysis gets even more complex for spatial pollutants, e.g. emitted at different points along a river

- (7) (a) **Emissions hard to monitor** because millions of emitters, and (b) **market has many levels** (oil→petrol →transport, coal→electricity→aluminium, etc) [ignored]
- Because of monitoring, **emitters not necess. acquitters** (to save cost, latter are primary fuel extractors and importers);
 - Emitters may or may not be able to pass carbon price up- or down-level in market (compare private motorist with coal-fired power station)
 - So who are **net losers** from carbon pricing is economically very **complex**, and which **deserve free permits/thresholds** is politically **contentious** – may well not include foreign firms!

Further questions about market control of CO₂

- **Wouldn't no free permits or thresholds save a great deal in rent-seeking costs?** Yes...but maybe resistance to pure mechanisms generates just as much rent-seeking?
- **Emission pricing unfair to poor consumers?** Yes, because poor spend more proportionally on carbon-intensive products – but both free permits/thresholds and permit/tax revenue can and should be used to redress this.
- **Morally repugnant to price the environment?** It's sad, but alternatives of draconian or ineffective controls worse.
- **Green consumerism an answer?** Take-up of voluntary CO₂-saving schemes (mainly electricity) is tiny, and why should only those who care pay, when all enjoy or suffer the same climate?

The New Zealand carbon tax

- **May 2005:** govt. said **carbon tax (fully recycled, but with no thresholds)** will start 1 Apr 2007 at NZ\$15/tCO₂
- Tax rate may be revised, as aimed at international price of CO₂, but capped at NZ\$25/t.
- Tax will apply to emissions from energy supply and use; process emissions; and fugitive energy emissions.
- Agricultural methane and nitrous oxide, and methane from the waste sector, not taxed.
- Firms can get **full or partial exemption from the tax** by “moving to world's best practice in emissions control” & signing a Negotiated Greenhouse Agreement,, aimed to prevent production moving (“leaking”) from NZ to countries with less stringent climate change policies.

The New Zealand carbon tax (contd.)

- **June 2005:** new forecasts predict NZ **36 Mt above Kyoto Protocol target**. When Govt agreed to ratify the K.P. and introduce carbon tax, **50 Mt below** was expected.

In-depth review will be conducted, and sent to Cabinet by 31 Oct 2005, on current climate policy.

- **August 2005** (election campaign), Federated Farmers: “...scrap the pointless carbon tax...which will increase costs for farms, businesses and consumers. It will damage NZ’s international competitiveness and have no discernible impact on greenhouse gas emissions or climate change.”
- **November 2005:** Revenue Minister Peter Dunne: “It is highly unlikely a carbon tax will come into force on the scheduled date of April 1, 2007”. Labour Govt is kept in office by Dunne's United Future Party and NZ First Party...

Conclusions / recommendations

- In distributing **tradable emission permits: avoid** divide between **all free** permits and **no free** permits. **Explore options between** – for % of free permits, and for who gets them (not necess. emitters or acquitters).
- In debating **emission tax: avoid** extreme of **pure tax** (even if revenue recycled). Consider **partial exemption with thresholds**, distributed like free permits would be.
- Hence make acceptable the tighter, cheaper control of **CO₂ emissions by rich countries** that permits and taxes offer. Under uncertainty, a **tax could be much cheaper**.
- **No panacea**. Many variants exist (especially over time); best solutions complex; combine with other policy instruments; not all problems, esp. international trade competition, are helped.

THE END

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