UA . IMDO
Postgraduate Course
Energy & Climate
5.6 EU Climate Policy Flagship: EU ETS

Emissions Trading, focused on EU ETS

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Warning

Several slides are like course text, not what prescriptions for good slides recommend.
Slides with a red stip are not discussed in class; focus is on technicalities & analysis.

YOU are expected to have read all the slides before class,
be ready to ask questions for clarification, more evidence
+ challenge the contents when you disagree.

Overview - Contents

1. Historical setting of emissions trading
2. Economics theory on emissions trading
3. Critique on neoclassical economics
4. Political economy analysis
5. Fit for 55
6. Conclusions
7. Annex: new electricity economics

USA: cradle of emissions trading

1960s: growing awareness about environmental harm by humans

- Population growth, Ehrlich's 'population bomb', IPAT: Impact=Population X Affluence X Technology K. Boulding (1964) suggests "birth licenses" to cap population growth: each woman receives 21 deci-children licenses free to transfer. Organizational and legal hurdles (e.g., how to enforce once a non-licensed child is born?). This mind teaser influenced H. Daly's belief in permit trading promising macrostability (efficacy) with microvariability (efficiency); equal treatment of participants (equity)
- J. Dales' 1968 book "Pollution, Property, and Prices" formulates emissions trading

US several experiments with trading permits

- River basin water pollution control, air pollution control, fisheries, …
- Increasing the flexibility/efficiency of emission permit allocation practices by allowing to nett, offset, cap emission sources under a bubble – implying exchanges
- Successful example: leaded gasoline phase out by US refineries

US acid rain control: SO_2 emissions trading from coal-fired power plants

- 1 jurisdiction (US); 1 informed-experienced regulator (EPA)
- 1 type of emitters: electricity companies – leakage not an issue
- 1 substance (SO_2); 1 technology (coal-fired power plants)
- 2 well-known SO_2 emission reduction means: low-sulfur coal, advanced scrubbers
- Free emission permits; little trade across companies
- System ended by 2010
- NOx control via separate regulations (i.e. market segmentation; trade as instrument submitted to environmental policy-making)

EU: GHG emissions trading & Tradable Green Certificates

December 1997, COP3 Kyoto: US (Al Gore) imposes 'Flexible Mechanisms'

- Global GHG permit markets as backbone of global climate policy
  - Most COP participants had never heard about emissions trading before Kyoto
- Clean Development Fund (demand by developing parties) turned in CDMechanism
  - EU delegation opposes but concedes for obtaining USA's signature on the Protocol
- In 2001,US (W.G. Bush administration) dumps the Kyoto Protocol
- CDM offsets: rich parties escape decarbonization duties; unclear 'additionality' in reducing emissions; perverse effects (China creates HFC23 flows for CDM credits); Certified Emission Right (CER) value dropped to almost 0

EU Commission U-turns from opponent to top advocate of ETS

- 2000 Green paper on GHG emissions trading within the EU: Cap and Trade as pure textbook recipe (Tight capping + Auctioning of permits + Market sets price + no bureaucracy)
  ⇔ 2003 Directive very different, e.g., auctions shelved for free donations of permits in worst way of grandfathering [slide 9]

Early experiments with Tradable Green Certificates (TGC)

- 1999 EU Commission advocates Tradable Green Certificates for promoting renewable electricity
  ⇔ Germany, Spain, … oppose and apply Feed-in-Tariffs for innovation in PV, wind and other RE technologies = success for decarbonization (now used in ETS as main CO2 reduction option)
- 2002 Belgium, UK, … try TGC, experience technological race to the bottom + skimming of excess profits [slide 5]

Context, proclamation, and 4 phases of the EU ETS

1990: European Commission (EC) proposes 'energy/CO_2' tax
adding yearly EUR1(€1)/ton CO_2 to obtain a €10 tax-rate in 2000
Energy supply & energy-intensive chemical companies sank the proposal

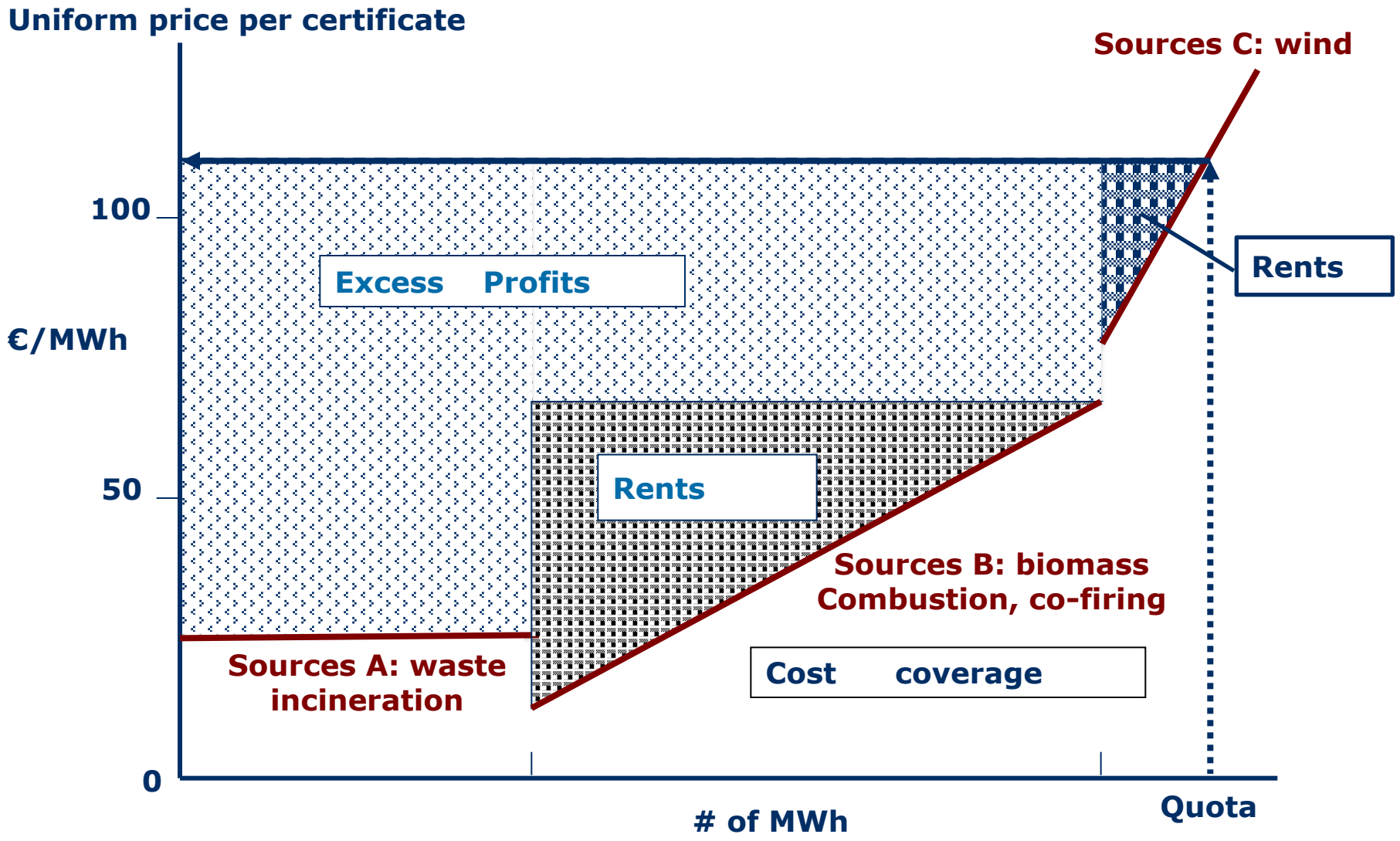
1997 COP3 Kyoto: EC disgruntled accepts Al Gore's Flexible Mechanisms.
An anti-tax coalition of fossil fuel (BP, Shell), electric power and industrial companies offer advice and help to construct a CO_2 emissions trading scheme
High approval by neoclassical economists: "finally politics accept superior market-based recipes"

2000 EC Green paper on GHG emissions trading as Cap and Trade within the EU, announcing:
'forcing' caps - stepwise reduced by phase + auctioned emission licenses + trade equalizes marginal abatement costs of emission sources + price-induced decarbonization innovation

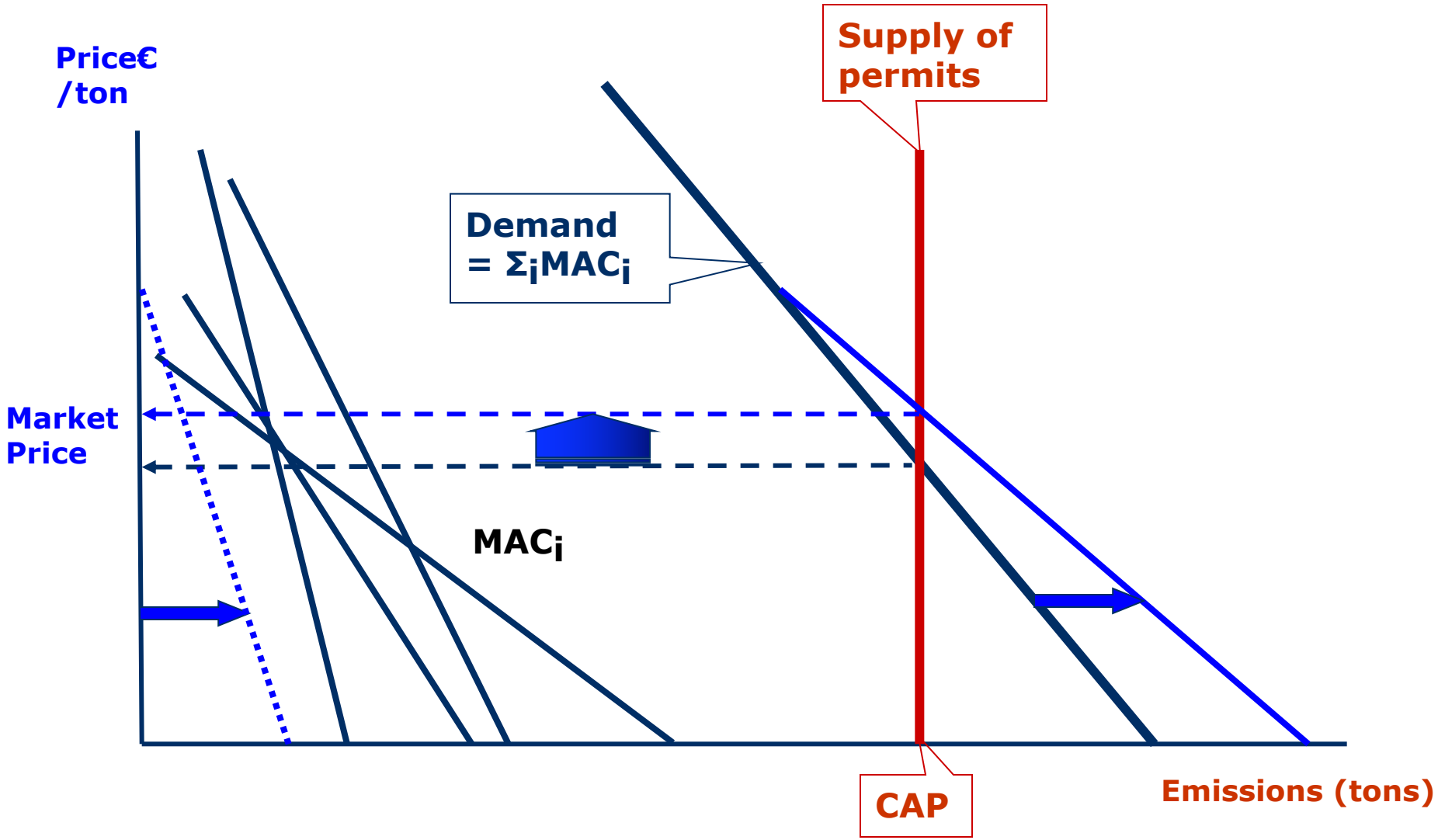
2003 Directive 2003/87/EC: very different from Green paper, for example: no tight caps but excessive free donations of emission permits, opaque murky trade

2005-2007: Phase 1 - -test phase. By over-allocation of free permits, the price crashed to 0; billion euro "windfall" profits (mainly electric power corporations)
2008-2012: Phase 2, similar, yet price crash avoided by banking 1.75 billion permit surplus into phase 3 + inflow CDM credits
2013-2020: Phase 3 electric power sector separate status + less free permits; creation of price control mechanism (Market Stability Reserve)
2021-2030: Phase 4 expected similar as phase 3: electricity generation decarbonizes, main industrial activities (EITE=Emission Intensive Trade Exposed) obtain free permits

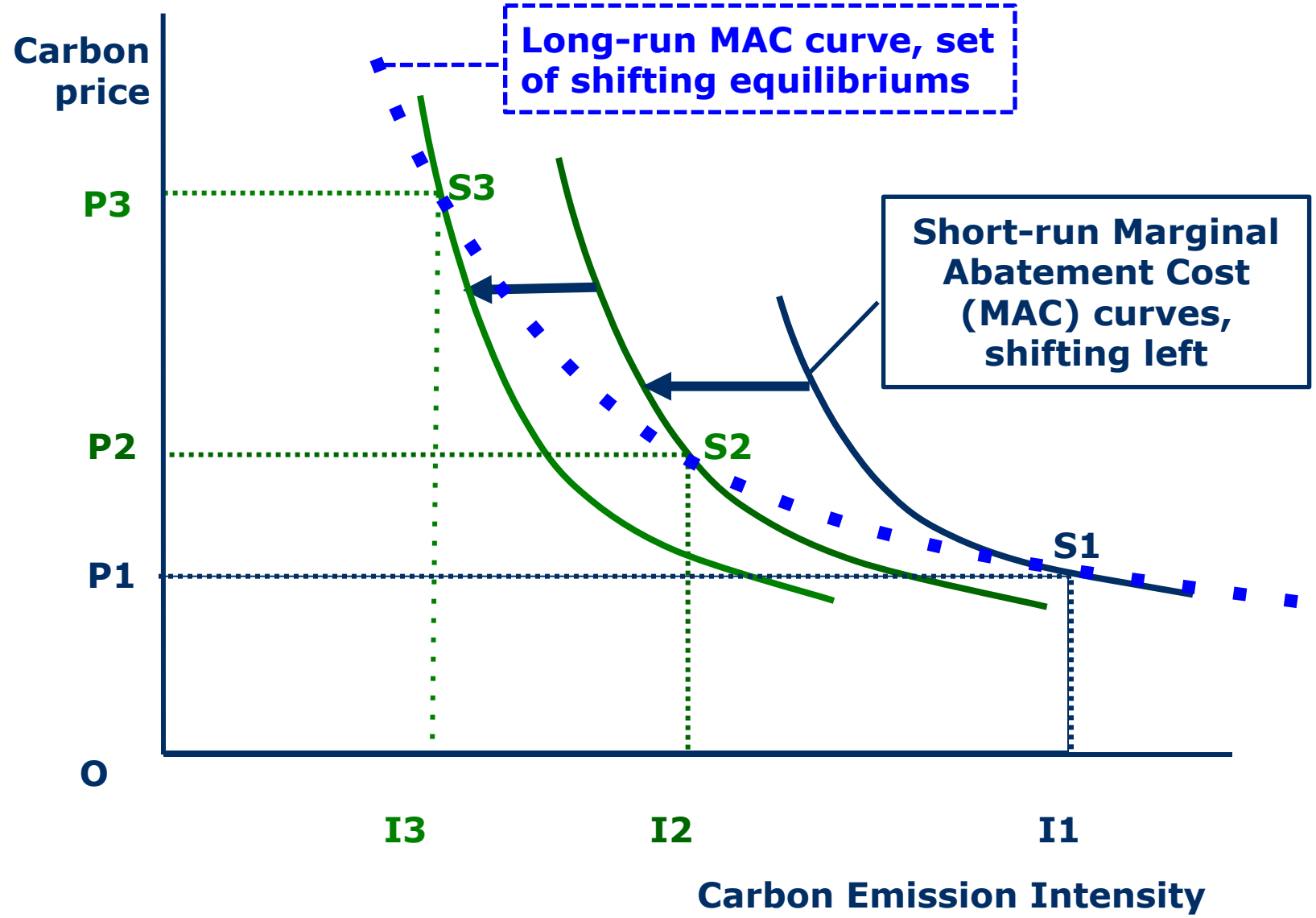
Tradable Green Certificate systems: Technological race to the bottom + Skimming of excess profits due to uniformity (lack of market segmentation)



Emissions Trading via CAP & TRADE



Innovations in decarbonization, induced by high carbon prices, shift Marginal Abatement cost curves and reduce carbon emission Intensities



CAP & TRADE: aspects of practical set-up

- **Define BUBBLE: Which activities are IN/OUT?, free of leakages**
  - **Relevant emission sources**
    - **Size: transaction costs allow only large emitters**
    - **Type of activities: homogeneous (1 sector) ⇔ heterogeneous**
  - **Geographical scope: designated area (Europe) ⇔ global**
    - **Span of public authority (market organizer, supervisor, regulator)**

- **CAP time-line: periodical, consecutive phases ⇔ linear reduction % for 'extinguishing' carbon emissions in 2050?**

- **Introduce quota supply in the market (see next slide)**
  - **Perfect auctions <> gaming the system**
  - **Free gift: Who gets how much? Why? How long?**

- **Supervise performance & transactions**
- **Preclude fraud, 'windfall' profits, VAT caroussels**

ETS is a levies-permits hybrid: color depends on system of allocating permits

LEVIES

- Yearly full auctioning of shrinking year quota
- Auctioning of quota for a trade period of a few years
- Auctions spread over years, following the demand for permits
- Partial auctioning, partial free permit gifts
- Assign permits to equalize Marginal Abatement Costs among participants [MACi = MACj = λ]
- Assign permits for emissions expected when Best Available Technologies (BAT) are applied
- Grandfathering permits based on historical emissions

PERMITS

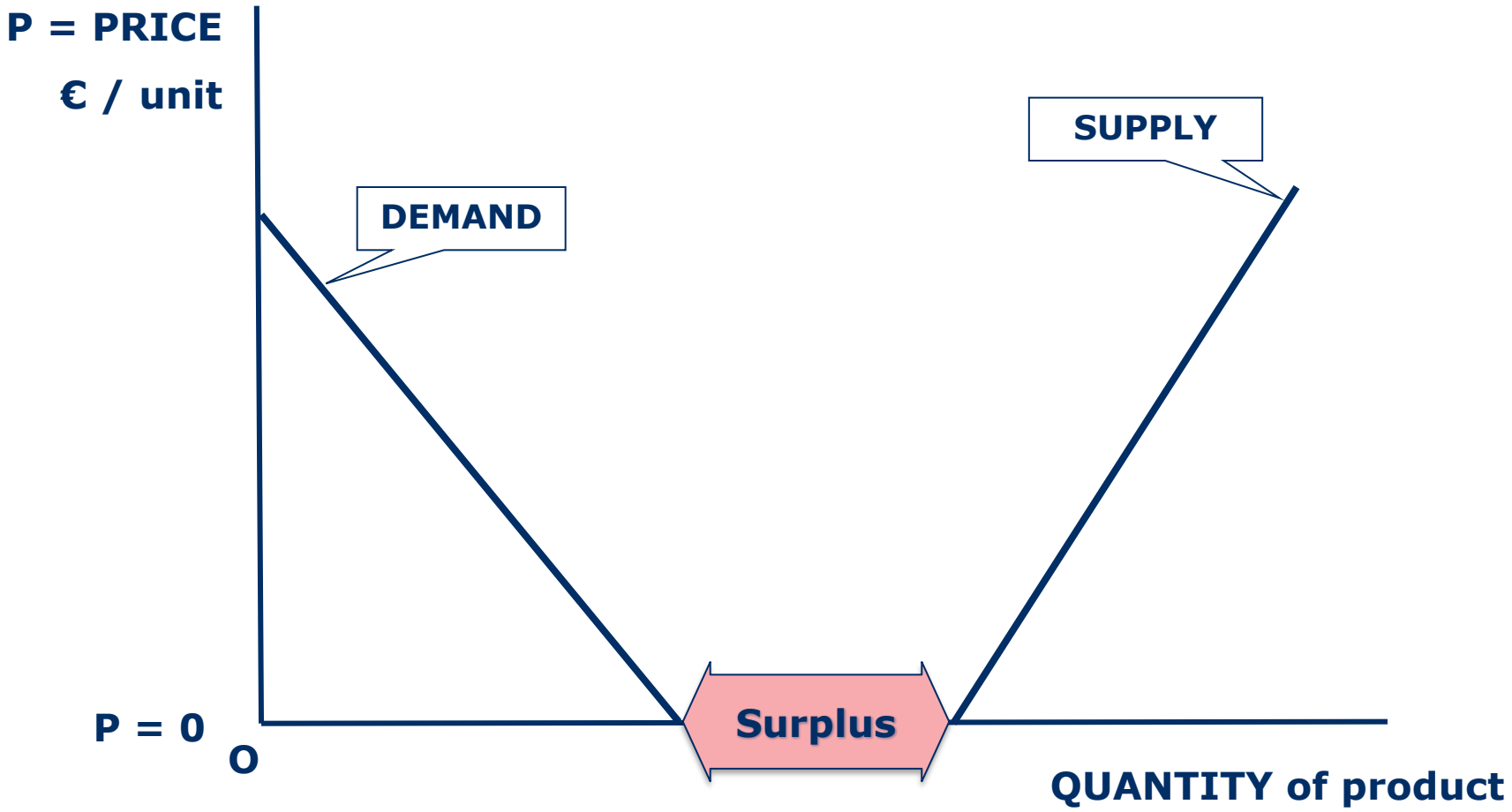
Don't get fooled by Carbon Prices, but Follow the Money

1. **Carbon Pricing: objectives (⌘ outcomes incl. distributional effects)**
   - Collect money for public treasuries
   - Incentivize more/less of particular activities, or change activities
   - Compensate or regulate the use of commons / public goods

2. **"Carbon Price": meaning confused by various contents, such as**
   - Speculation price at the carbon permit exchanges (Leipzig, London)
   - Fringe price (confused with Marginal Cost price)
   - Symbol of 'market performance' of EU ETS, yet not being a carbon market
   - Carbon prices are administratively fixed via the 'Market Stability Reserve'

3. **MONEY counts ⇔ hidden volumes, origin, destination, distribution, …**
   - Firms select investments via capital budgetting, discounted cash flows
   - Firms pursue 'above-average profits'
   - Firms exploit every opportunity to cash rents, royalties, excessive profits

Economic definition of WASTE:
"a product which supply exceeds demand at Price=0" i.e., surplus exists

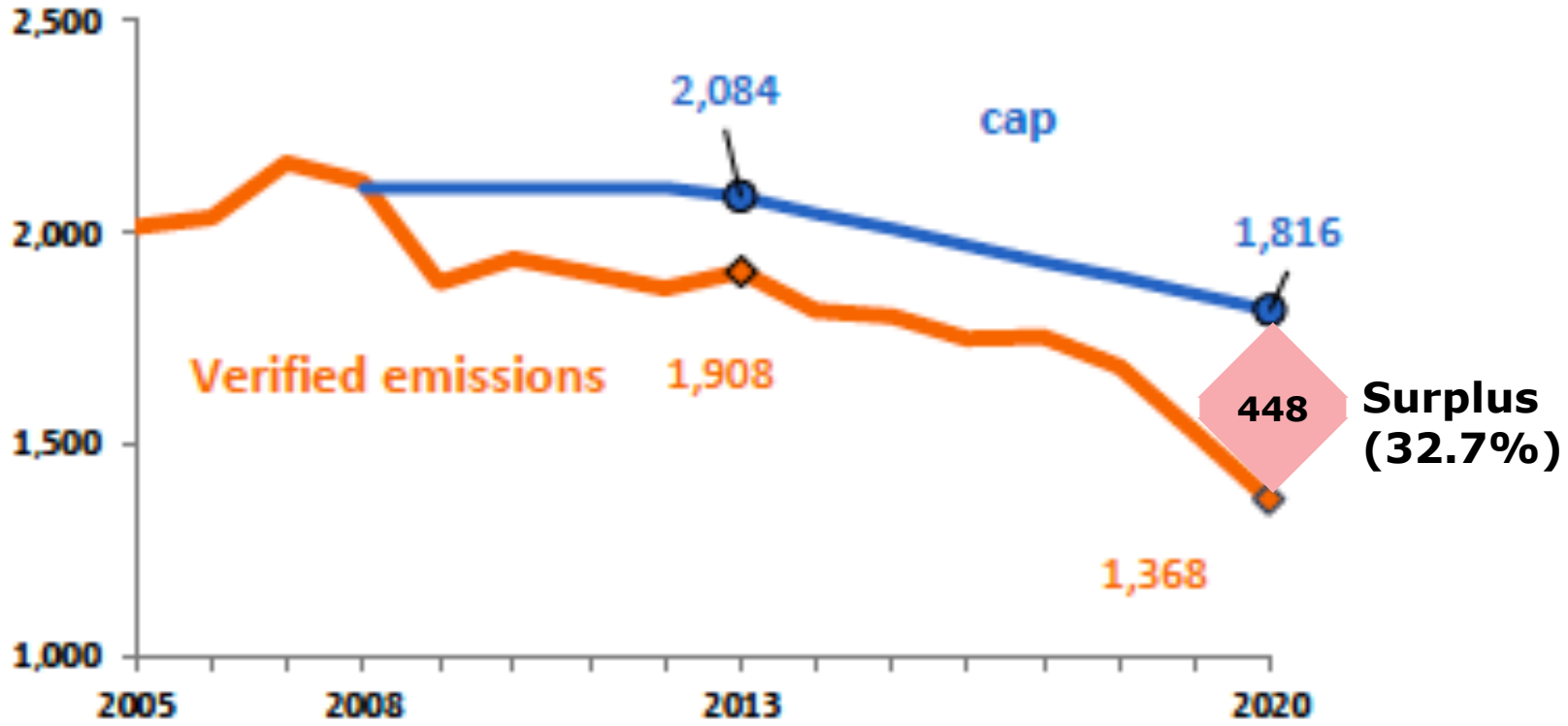


Surplus permits in the EU ETS (2008-2020)

Source: Wegener Center, published in Marcu et al. 2021. State of the EU ETS Report, p.11

Surplus = difference between cap (blue curve) and Verified emissions (brown curve).
Verified emissions = sum of permits for mentioned year, surrendered year after (by April, 30)

Million ton CO_2 emission



Critique #1: negating and abusing diversity

1. **Ambigious views**
   - On the one hand, diversity is ignored, replaced by averages, representative consumers, abstract producers, unlimited substitutability. Disturbance of the mathematical abstraction is labeled as cost.
   - On the other hand, heterogeneity is seen as source of gains, to capture by trade. The more and deeper heterogeneity, the more gains in the air.

2. **The 'holy grail' mirage of Global Uniform Carbon Price (GUCP)**
   - Harmonized global tax rate or worldwide emissions trading
   - Labeled as ideal instruments, maximizing economic efficiency

3. **Evaluating GUCP performance**
   - Impossible because GUCP does not exist
   - Observation: a uniform price on heterogeneous cases ends in unplanned, intricate ad-hoc adaptations, exceptions, exemptions, … a mess

   [example: Flemish 'Tradable Green Certificate' system, launched in 2002]
   [example: EU ETS, launched in 2005]

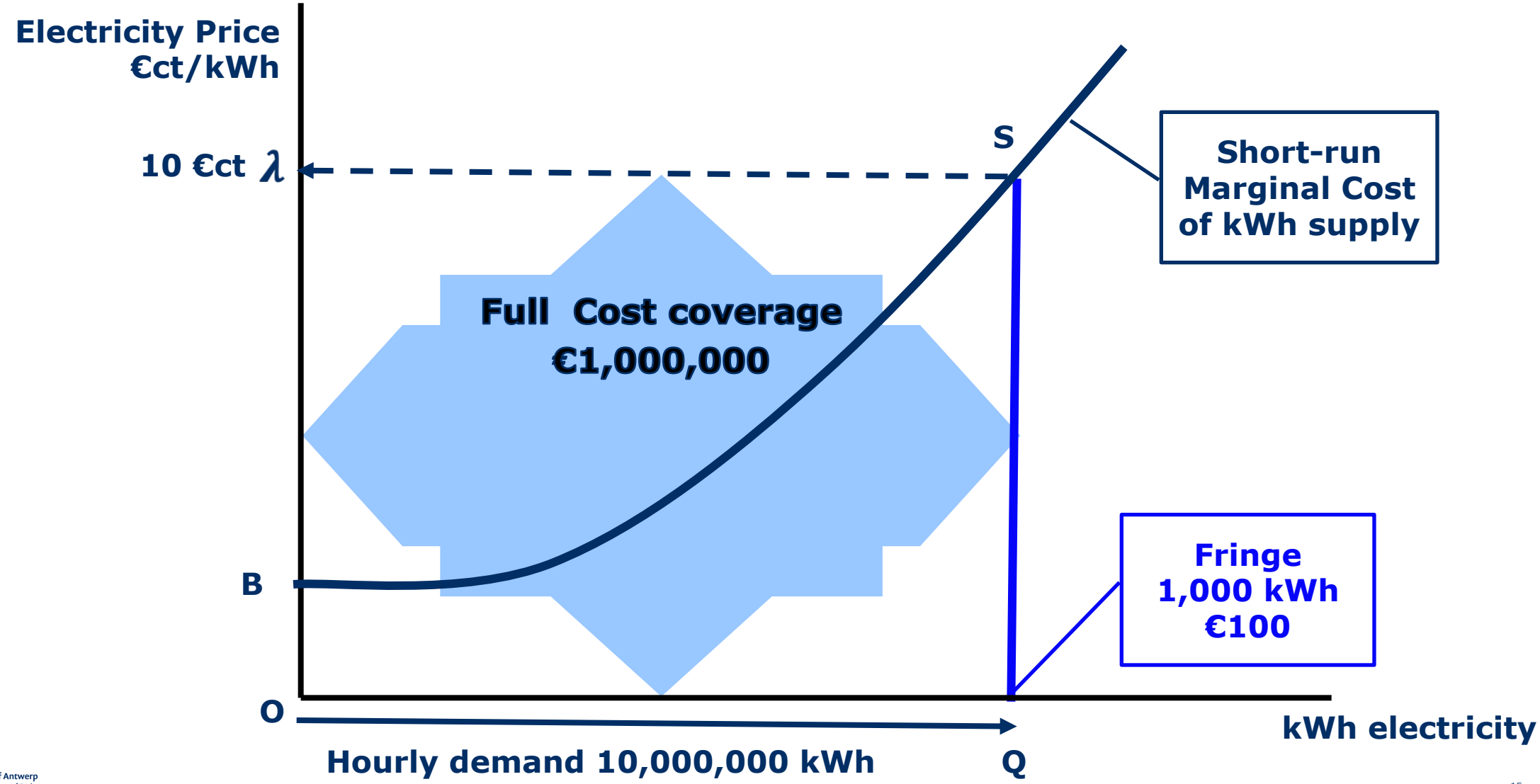
Critique #2: uniform price-induced innovation

1. **THE OPPOSITE: specific Feed-in Tariffs (FiT) have pulled Renewable Electricity generation technology to technical-financial maturity**
   - Germany, Denmark, … applied specific FiTs for diverse RE technologies
   - 2001: Germany rejects EU market-based Tradable Green Certificates (TGC)
   - Flanders, UK, … apply TGC: technological race to the bottom; excess profits
   - 2014 Energy corporations lobby EU Commissioner Almunia, effecting new State Aid guidelines prioritize large-scale RE projects + nuclear subsidy [see taxonomy debate in 2021-22, declaring nuclear as 'sustainable']

2. **EU ETS triggers no decarbonizing innovations**
   - Business-as-Usual of energy & industrial corporations continued
   - Firms reject paying for emissions, environmental innovation, ask subsidies
   - Electricity producers build coal-fired power plants [2008-2018: Nl, D]
     … now free-ride on FiT innovation results for coal phase-out
     … meet the ETS emissions decreases in phase III & IV [2013-2020;2021-2030]

3. **Integrated Assessment Models (IAM) used by IPCC WG3**
   - Incorporate neoclassical recipe of uniform price-induced innovation
   - Hence, model results and policy recommendations are problematic

Critique #3: Fringe price equalized to Marginal cost price (to pardon free permit donations)



Political Economy (PE) and Discursive power

PE is the study of rational decisions in a context of political and economic institutions. (Banks and Hanushek 1997)

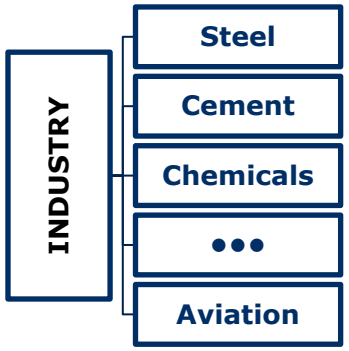
PE analysis is concerned with the interaction of political and economic processes within a society: the distribution of power and wealth between different groups and individuals, and the processes that create, sustain and transform these relationships over time. (Collinson 2003)

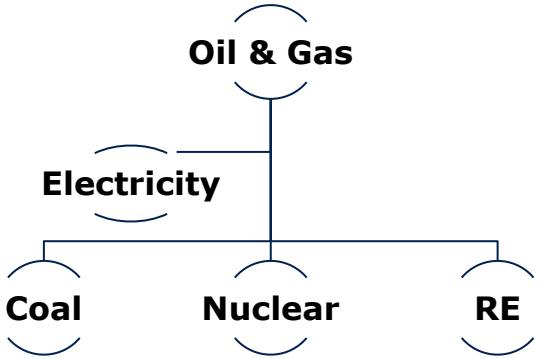
PE analysis is the study of societal icebergs: 10% visible, 90% under the waterline. Secrecy intensifies with widening gaps between discourse and reality. Hypocrisy, deceit undermines trust, a crucial factor in human relations, also economic relations.

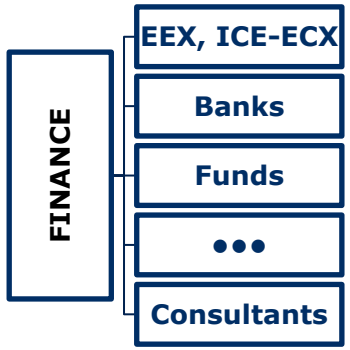
Discursive power
Peoples' limited capacity in absorbing information, acquiring knowledge, bounded rationality, … provide ample room for influencing by IDEAS.
The direction and degree of influencing depends on discursive power, constructed around 4 components (Fuchs 2007)

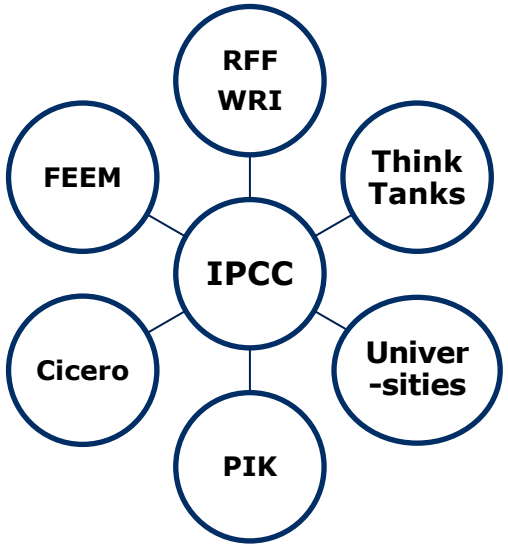
EU ETS constructed, promoted, safeguarded by superior discursive power:
1. **Symbol: the "carbon price" alias posted prices at permit exchanges**
2. **Narrative: Cap and Trade (effective, efficient, fair, no bureaucracy)**
3. **'Compelling' arguments: neoclassical economic theory accepted as superior**
4. **'Effective' evidence: 'instrument constituency' disguises, negates adversarial facts**

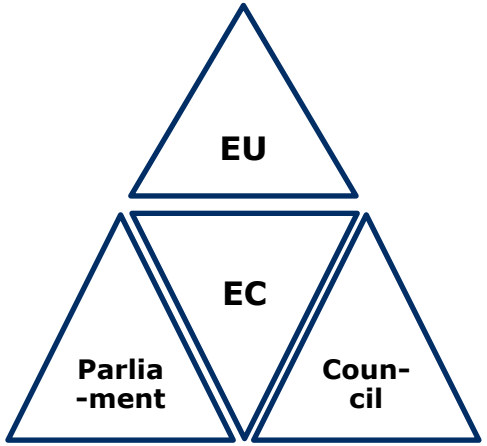
4. Political economy ACTORS











World Bank, OECD, IEA, IAEA, ●●●

UNFCCC, COPs

Sovereign Parties, incl. EU Member States

Local Authorities, Cities

Non-ETS electricity consumers / prosumers

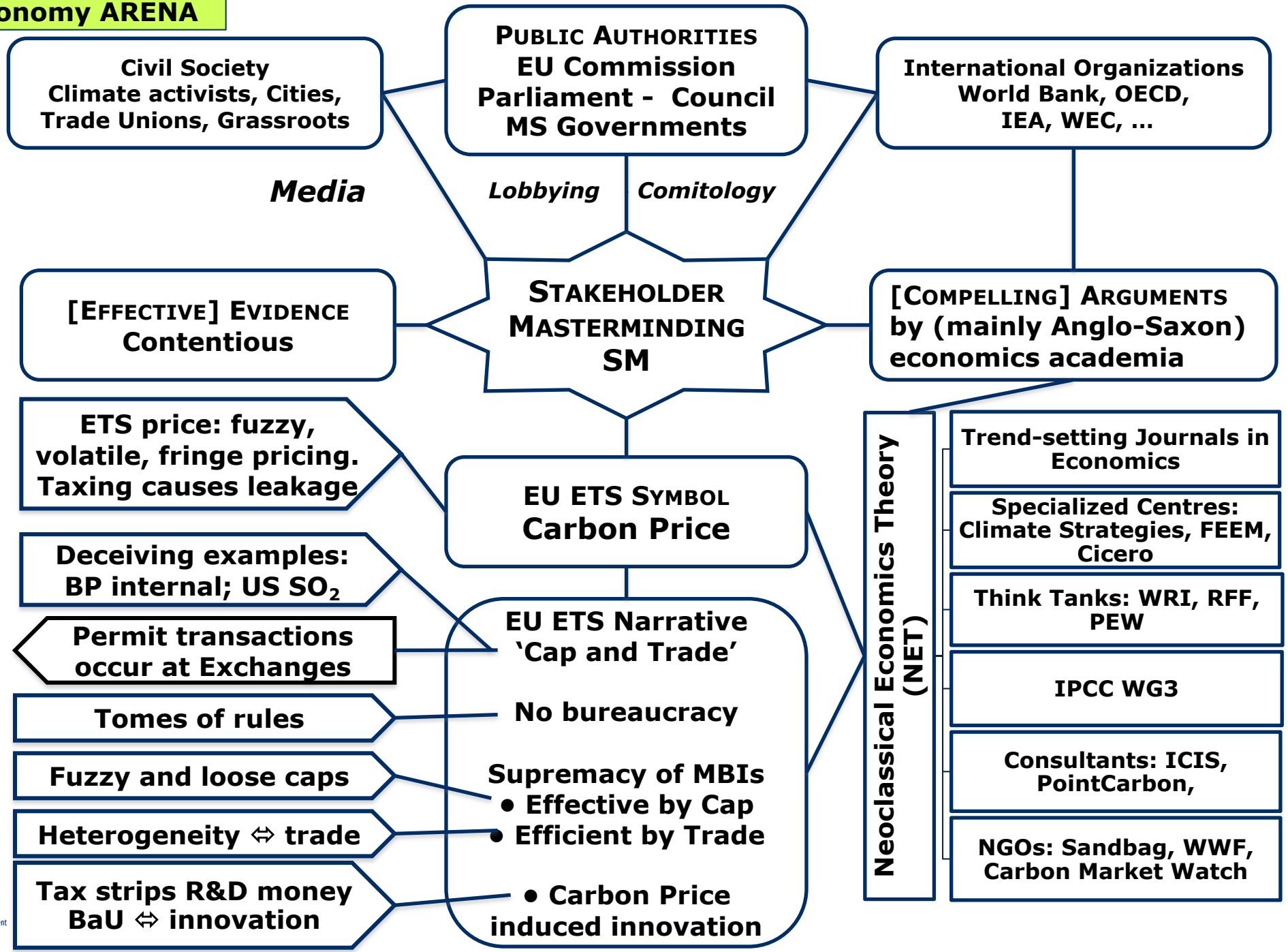
Business Federations, general, by sector, by item

Trade Unions

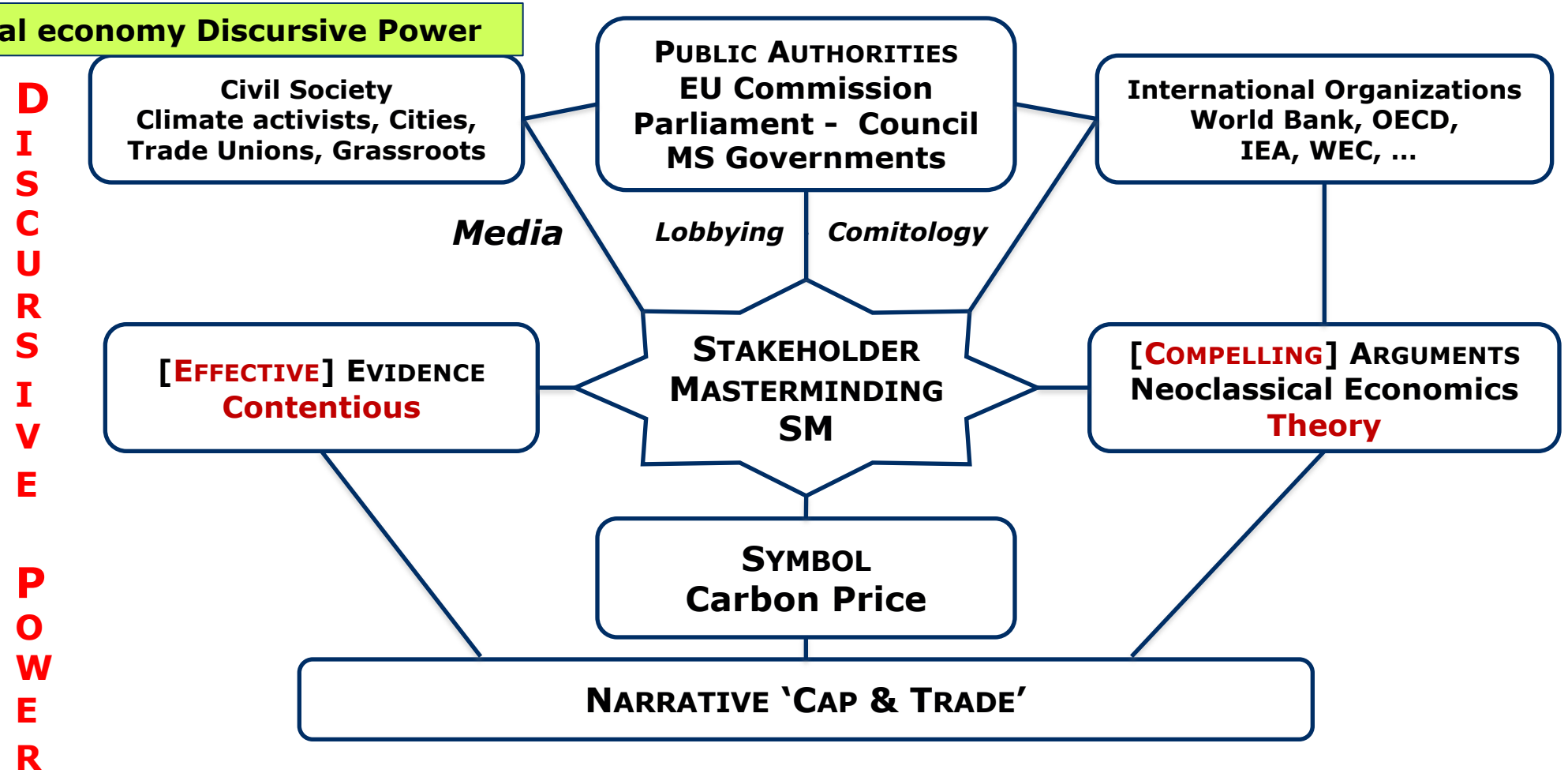
Climate NGOs, e.g. Friends of the Earth, Corporate Europe Observatory CAN-Europe, Greenpeace, WWF, Carbon Market Watch, Sandbag, ●●●

Climate activists
Youth for Climate
Extinction Rebellion
Hambacher Wald Protesters
●●●

4. Political economy ARENA



4. Political economy Discursive Power



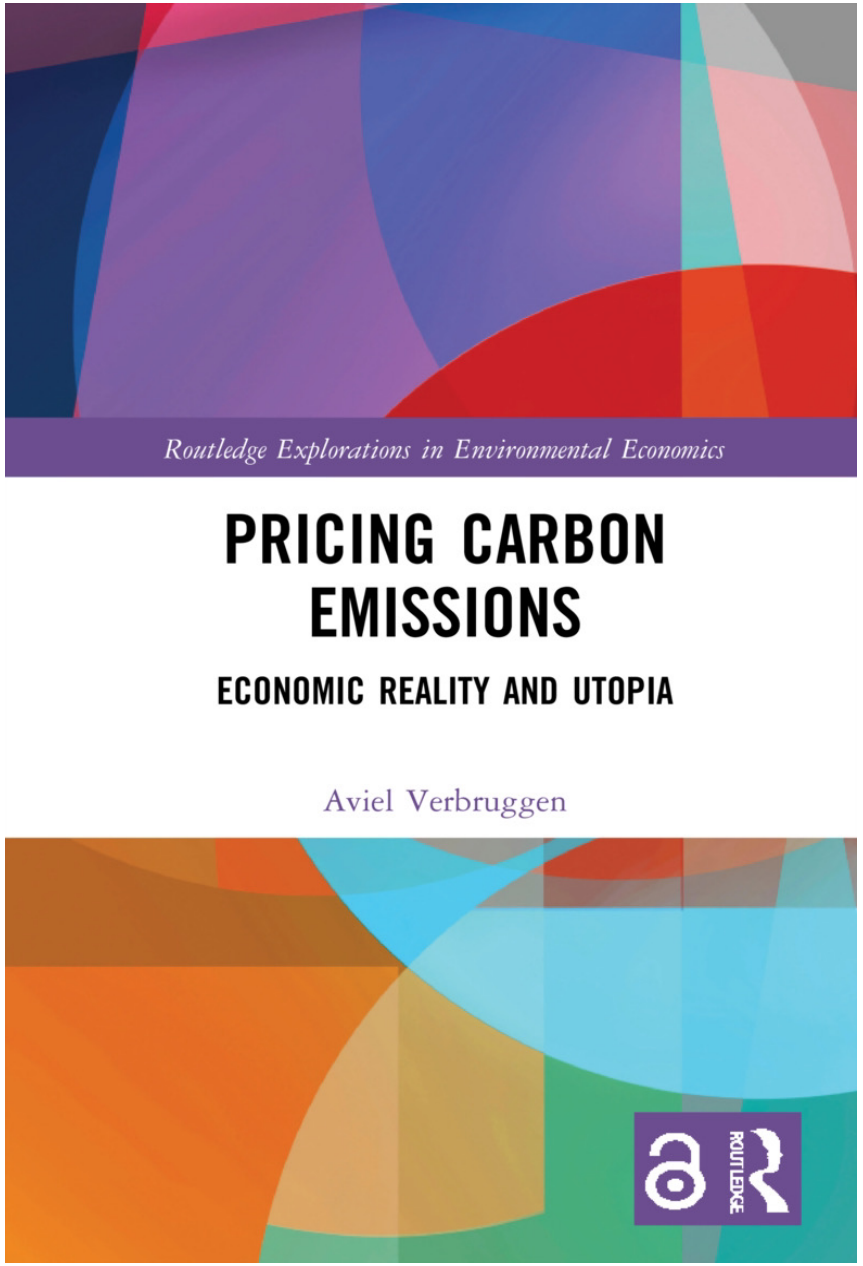
Bewildering discursive power upholds the CAP & TRADE façade, notwithstanding

- **evidence is contentious, not effective**
- **formal mathematical theory as argument is not compelling**
- **CAP & TRADE narrative hides opposite reality**

Chapter 7: A political economy of the EU ETS

Highlights:

- **Stakeholder Masterminding (exceeds 'captured regulation'); in SM rule making, initiative and dominant role are with private corporations**
- **Discursive power prevails; CaT narrative, permit price symbol, discourse control via neoclassical economics, cover-up of deception**
- **Price Induced Technology Innovation PITI not observed – not working (!! IPCC policy analysis based on IAM scenarios assuming PITI)**
- **Giant power corporations built coal fired power plants during Phases 2 &3 of EU ETS in Germany, the Netherlands**
- **Wind, PV, RE innovations result from public policy via specific Feed-in-Tariffs ⇔ neoclassical recipes**
- **By now building Renewable Electricity plants giant power companies easily meet the ETS caps;**
- **Phase 4: BaU not endangered for industries, oil & gas sector. A third decade lost for urgent decarbonization of industrial activities**
- **ETS instrument is central concern: permit price notations is success yardstick, yet settled administratively & speculation. Means substitute for ends**
- **Fringe price (a scam) is confused with full marginal cost price**



EU ETS Façade vs. Reality

EC(2000) CAP&TRADE Façade

EFFECTIVE reduction of emissions by stringent CAPS

EFFCIENCY in reduction by equalizing the Marginal Abatement Costs of all emitting activities,
buying permits at auctions,
exchange via TRADE

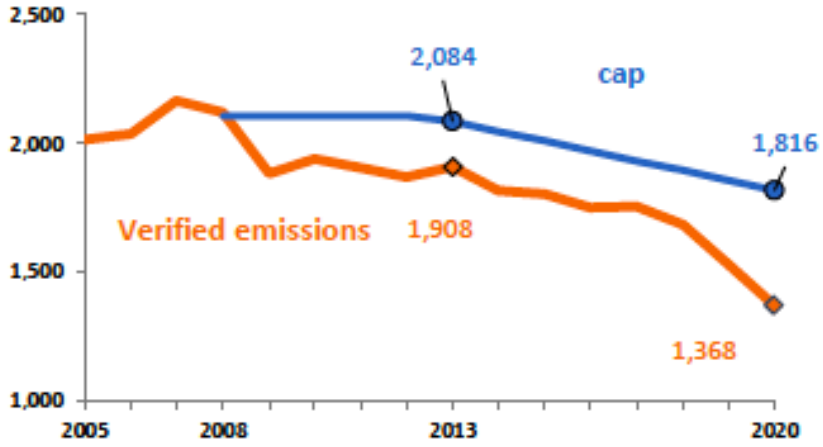
Permit price set by market forces

Uniform price-induced innovation for decarbonising activities

No bureaucracy, market allocates

Fairness, Polluter Pays Principle

2005-2020 Reality



Oversized and permeable CAPS
Surplus permits in phases I, II, III [2005-2020]

Figure: Caps vs. Verified emissions
Source:
Marcu et al. (2021). State of the EU ETS

Free permit donations (grandfathered, then benchmarked)
… continue in phase IV [2021-2030] for EITE activities
Speculation with surplus permits is not 'carbon trade'

Administrative price fixing via Market Stability Reserve

Declining emissions by external economic factors and by competitive RE technologies (irena.org)

Incredible mess. Hidden ownership, transactions, money flows

People Pays Polluters: €billions in rent skimming on top of auction payments, both charged on non-ETS electricity bills

Fit for 55

- **Continues + expands EU ETS + additional ETS for vehicles and buildings**
- **Similar to ETS in discourse, stakeholder masterminding, bureaucracy, …**
- **Confined to European financial-economic interests**
- **Missing universal scope, while climate is a global commons**
- **Skips Our Common Future Sustainable Development. Prolongs neoliberalism**
  - Corporate interests prevail (like electricity corporations skim rents from billing electricity users, fossil fuel sellers can sqeeze money out of vehicle and building users)
  - Material growth as solution (e.g., aviation gets free skies when shielded by EU ETS)
  - No cure for inequality
- **EU ETS is 20^{+} years lost in climate politics; Fit for 55 adds another decade**
- **"Carbon markets" do not solve the climate crisis; they amplify the crisis.**

Unclear and dubious ETS Carbon Prices

CaT theory **"A uniform carbon price sets all MAC_i equal (= total AC minimum)" is the main selling point of EU ETS, however:**

- **Emission sources in the ETS face very different prices**
- **For most sources, prices were/are zero**
- **Fringe prices unlikely induce any action, certainly not breakthrough innovations**

Electric power corporations active roles

- ✓ **Manage main parts of ETS billing**
- ✓ **Most electric utilities have experience**
  - ✓ **in market trading (fossil fuel trading)**
  - ✓ **as intermediary between public authorities and constituencies**
- ✓ **Bulk share of bills (generating ETSrevenues) charged on electricity consumers**

Distribution of the financial burdens

- ✓ **Governments (UK, Germany, Belgium, …) reimburse EITE 75-85% of ETS driven electricity expenses**
- ✓ **I.e. non-ETS electricity consumers pay the bulk of ETS bills**
- ✓ **Higher price notations = more money for paying 'coal exit' of power cy's**

Democratic deficit of opaque EU ETS processes & resulting money flows

- **EU ETS & Fit for 55 evolve from shielding Business as Usual of industry to systems charging non-ETS electricity and energy users, the expenses of stranded assets and of new investments in decarbonization (‘Innovation’ funds)**
- **Hence, the so-called ‘carbon markets’ metamorphose in tax raising systems. However, taxing is the exclusive right of politics, democratically authorized by their constituencies paying the taxes. + Full transparency on the money flows**
- **Inequitable application of the Polluter Pays Principle by loading most burdens on non-ETS energy users**
- **Bulk taxing of carbon emissions of companies is not helpful. Taxing is fantastic in pushing people over the ridge from old practices & technologies to <u>available</u> alternatives (e.g., leaded to unleaded gasoline in the 1980s; e.g. electric cars when the full range is available and affordable for the whole constituency)**

EU ETS amplifies the climate crisis

- It dilutes the Urgency to Act-Now needed for avoiding
  - Irreversible climate collapse
  - Irreversible biodiversity loss
  - Societal disintegration
- ETS is a product of corporate power
  - Thriving in neoliberal regimes, obstructing Sustainable Development
  - Sanctified by neoclassical economics
- Major issues
  - Carbon Pricing and Money
  - Neoclassical economics illusions (3 essential ones)
  - Bewildering discursive power of Stakeholder Masterminding
  - CAP & TRADE theory conceals opposite practices
- EU's 'Fit for 55' package adds an additional ETS for fuels used in transport & buildings, supervised by fossil fuel suppliers
- End-users pay the 'revenues' of the system

Some ideas about future electricity supply (book section 8.1.3)

- Electricity regulation and pricing is far more important than carbon taxing
- The inevitable transformation of energy supplies to full harvested renewable currents (wind, light, water, geothermal) outdates the present electricity economics theory
- A new theory is needed, conceived for systems of 100% RE supplies with (almost) zero marginal costs (except biomass), and ca. 80% <u>not</u> on command
- New challenges/opportunities are redundancy in capacities, c.q. supplies, islanding of loads and generation, service reliability at different levels in the system and end-uses
- Options to address the challenges: reward capacity investment expenses by Feed-in-Tariffs (now ”power purchasing contracts”); for ranking deliveries to the grid (replacing outdated merit order ranking based on fossil fuel combustion) apply the principle of proximity between generation and end-use; pricing of sold power varies by reliability indicators with the responsibility for ISOs to respect bands (in Belgium ELIA + in Flanders Fluvius as responsible agents)
- ICT, big data processing, realtime optimizations, … play a significant role
- Local bottom-up projects (like Lovitas). Some may succeed in full islanding (with H2 storage and fuel cells); others will continue to depend for complementary and back-up power on the grid (then, the terms of interaction with the grid are crucial)
- Proper relationship between central top-down generation & decentral bottom-up, based on the principle ‘central complements decentral’ instead of today’s ‘central pushes decentral away’