University of Antwerp - Climate Initiative
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Climate Change, Energy Use, and Mitigation Policy

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Some related publications:

Windfall and other profits. *Energy Policy* 36 (2008) 3249-51
Kyoto, Bali, Copenhagen, … back to Washington: a practical look at climate change policy. *Harvard College economics review* 3:1(2008) 15-19
Economische benadering van milieu en milieubehoud (2008). *Garant*, Antwerpen-Apeldoorn, 211p.
Beyond Kyoto, plan B: A climate policy master plan based on transparent metrics. *Ecological Economics* 68 (2009) 2930-37
Dringend en drastisch anders beginnen na Kopenhagen. *SAR MiNaRaad* (2010), 15p.
De bruikbaarheid van kosten-batenanalyse om maatschappelijk te beslissen. *Streven* 78:11 (2011) 997-1010
A Turbo Drive for the Global Reduction of Energy-Related CO_2 Emissions. *Sustainability* 3 (2011) 632-48
Preparing the design of robust climate policy architectures. *Int. Environmental Agreements: Politics, Law and Economics* 11 (2011) 275-95
Balancing incumbent and opposite perspectives on key issues in the 100% renewable electricity transition *IRENEC* (2012) 315-19
Revocability and reversibility in societal decision-making. *Ecological Economics 85* (2013) 20-27

Overview of lecture

1. Challenges:
   Climate Change ongoing
   Jammed policy process

2. Energy use:
Core of the problem

3. Climate policy:
* Essence
* Principles
* Complicated

4. Radical
but
Rational

5. "Time is always ripe to do right" (Nelson Mandela)
* Serious about +2°C
* Decompose and decentralize
* Yearly, verified progress
* Performance based transfers from rich to poor
* Redirect UNFCCC & Overhaul COP

Challenge #1:
Our planet gets fever

Since industrial revolution

+1°C today

+1.6°C for sure because GHG already in the air

+2°C hopefully: Copenhagen Accord (2009)

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+5°C: Business-as-usual since World War II

Challenge #2:
STOP mounting Concentrations

280 ppm before the year 1800

387 ppm CO_2 / 432 ppm CO_2eq. in 2009

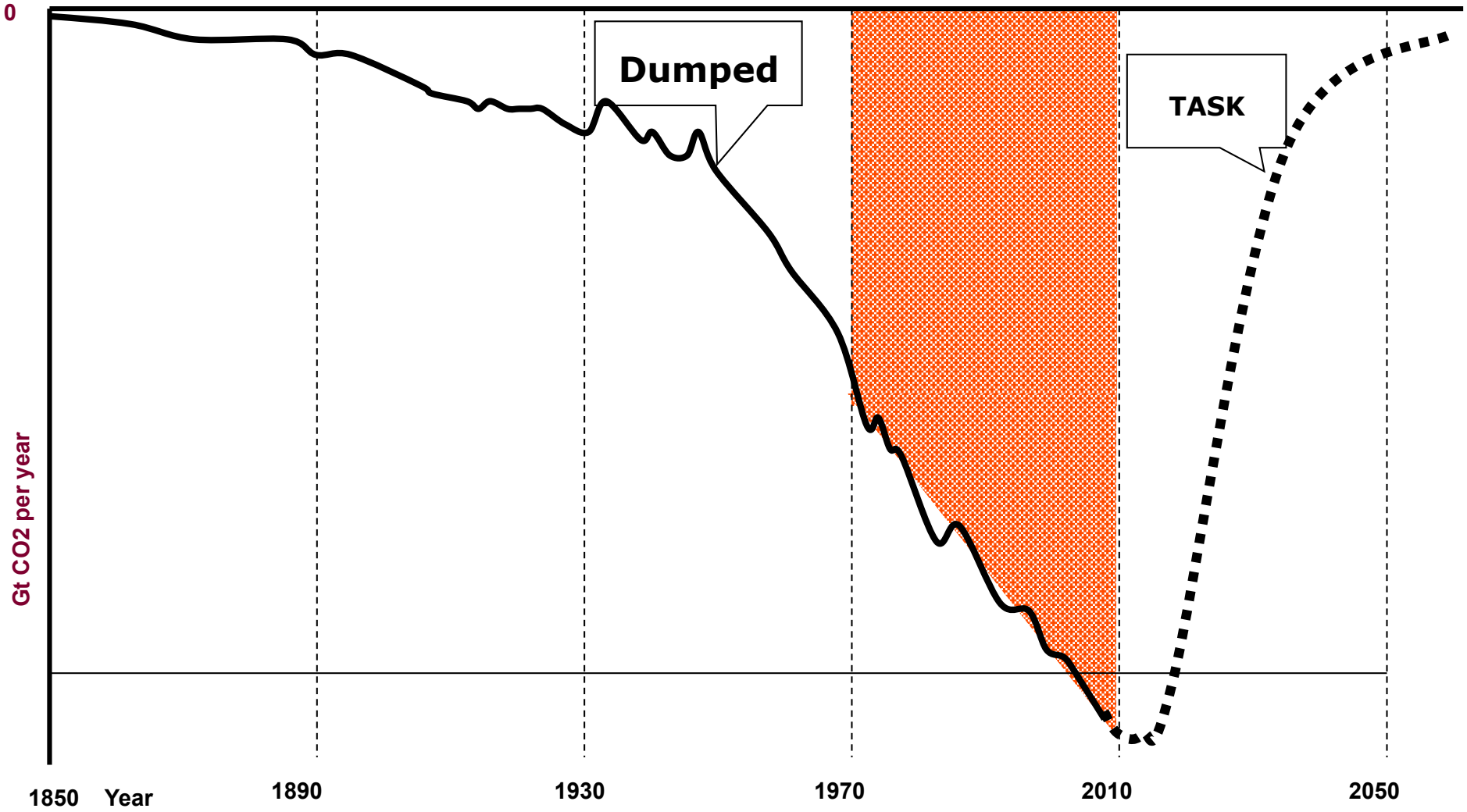
…

+ ≈2 ppm: every year of Business-as-usual

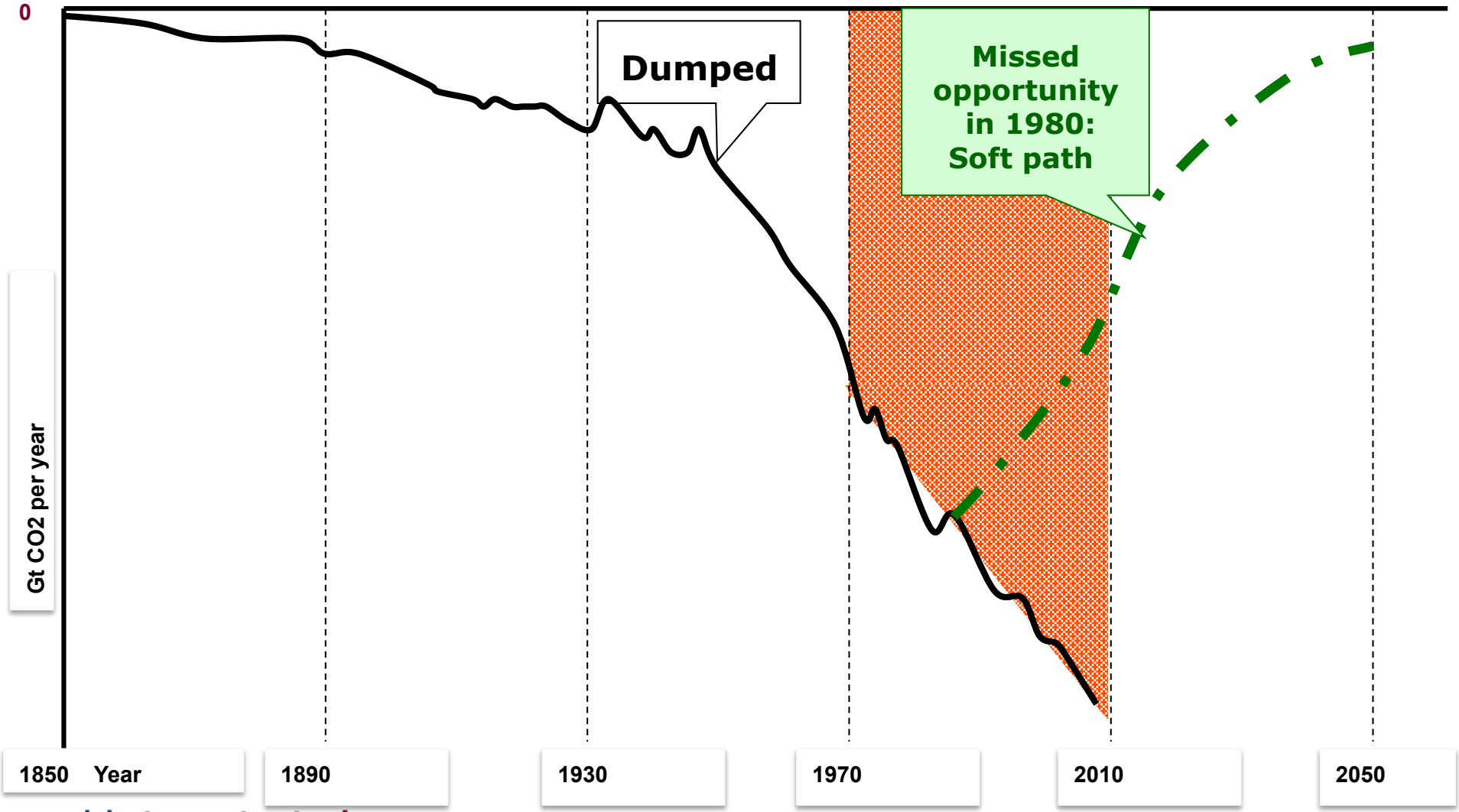
For a ¾ probability fever below +2°C

keep CO_2e below 400 ppm

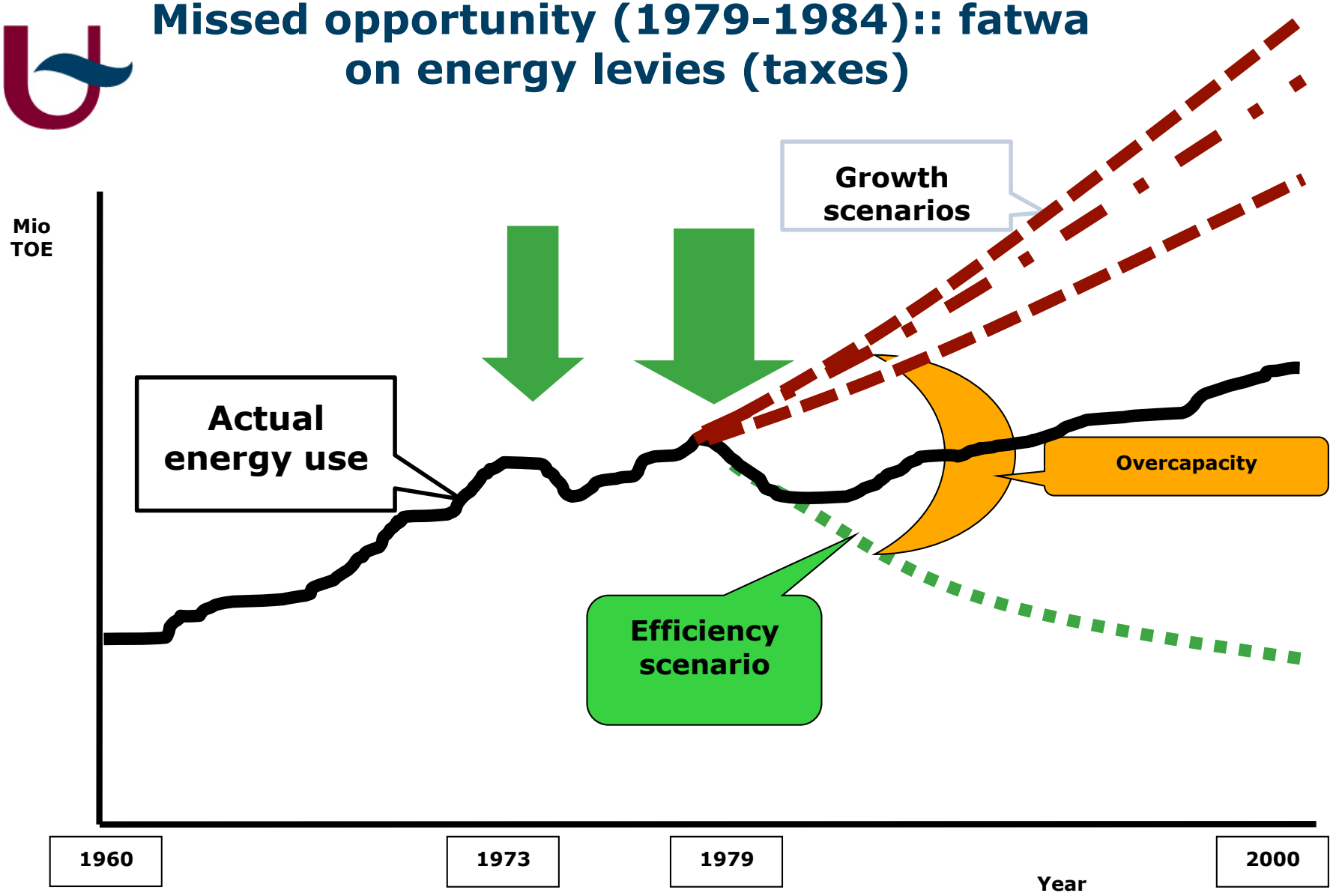
Challenge #3:
Revert Emission-trends



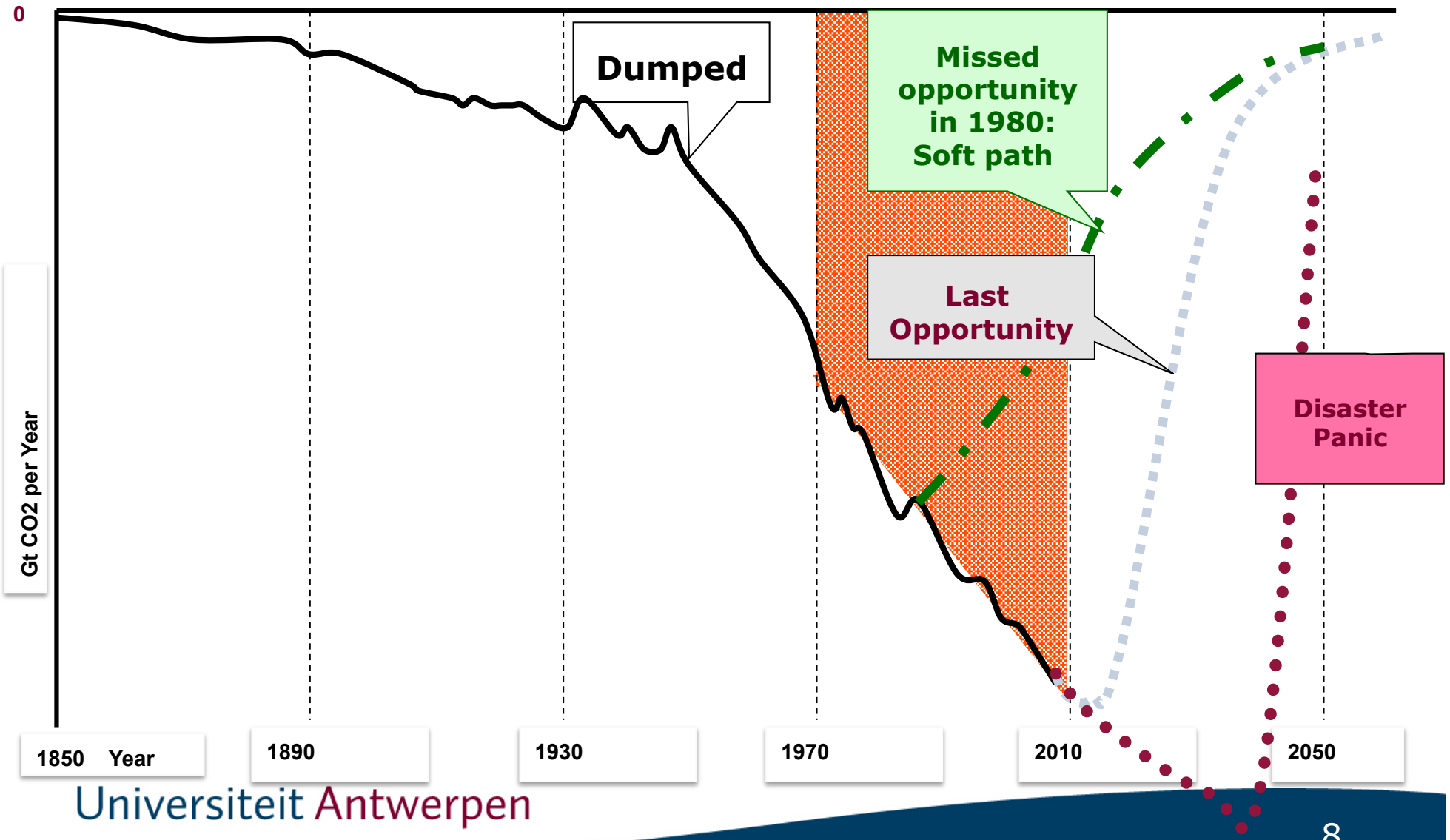
1980: missed transition opportunity



Missed opportunity (1979-1984):: fatwa on energy levies (taxes)



Last opportunity on safe transition



Challenge #4: jammed Kyoto process (1)

* Zero-sum games ➔ negative spiral/suspicion

  What you gain, I loose - What I gain, you loose

* Mitigation pledges ("targets & timetables"/actions)

  Mingling too much: Population, Affluence, Energy, …

  Too little, too late: baseline 1990 / horizon 2020

  - unclear, contentious, …
  - outdated, hot air, …
  - blocks & interrupts steady progress
  - Politicians "engaging" their followers

  Legally or politically binding? Enforcement?

  MRV (Monitoring – Reporting – Verification)

Kyoto targets

Definition	Weaknesses	Workable Alternative
Pledged targets for (caps on) GHG emissions reductions	GHG emissions cover too much at once: population, wealth, energy intensity, and carbon intensity.	Address drivers one by one, for lowering energy and carbon intensities.
numbered tons or percentage reductions	Actual meaning of numbers is opaque and shifts with population, economic and technology dynamics, offsets allowed	Obligations for step-wise reducing a country's energy and carbon intensities are defined unambiguously
by some distant future year (e.g. 2020, 2030, 2050)	Delivery beyond 5-8 years (one or two presidential terms) lacks urgency and erodes responsibility	Immediate steps in the right direction, with yearly evaluating progress and adjusting step-width
from baseline 1990	Link with reality is further diluting with every year passing. However, updating baselines entails perverse effects, and would create an additional stalemate	Intensity baselines are two year back, and move up every year; energy intensity must ever fall and carbon intensity must decline to almost zero
for Annex-I countries	Annex I / II classification is too rudimentary, linked to 1990 emissions	Countries are ranked only by $GDP/capita, and yearly graduate on that scale

Challenge #4: Jammed Kyoto process (2)

- *Emissions Trading
  - Simplistic theory of "perfect" market
  - => Crash on the complex, diverse realities
    - => Comitology (lobbies dominate process)
  - Swindle profits, fraud (undermines social cohesion)
  - Disrupting actual policies in place (scythe metaphor)
- *CDM
  - Red tape, fraud, perverse effects
  - OFFSETS (rich buy rights from poor): delay + defect by rich countries on energy transition duty
- *Transfers, redistribution, sustainability
  - Structural approach ⇔ paternalism
    - Pledges ⇔ Obligations ⇔ Actual transfers
    - Graduation ⇔ Sticking to Annex I / non-Annex I sets
    - Performance related payments / receipts?

Challenge #5:
Who cares about climate change?

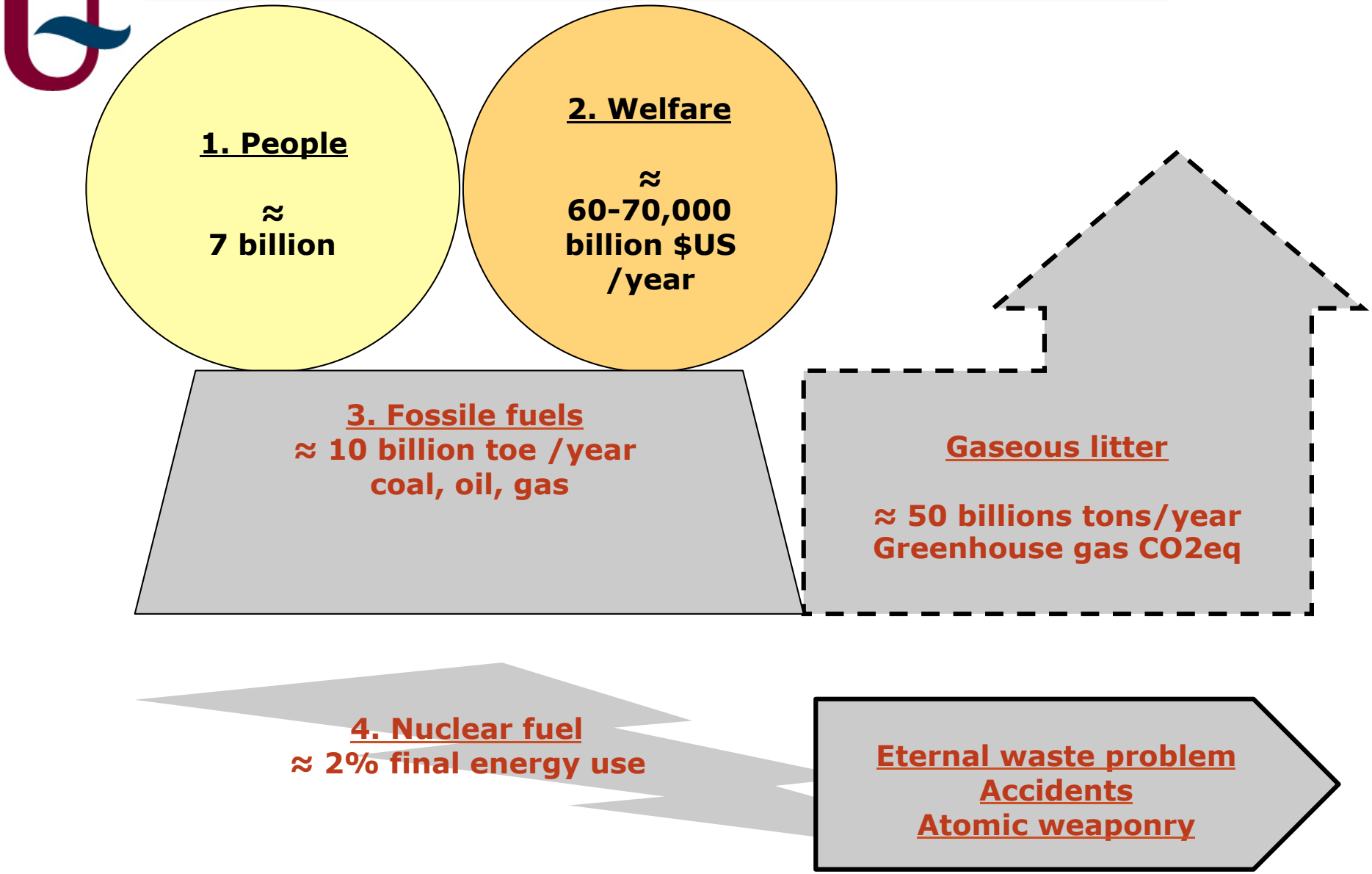
1. **Individuals, groups, organizations, authorities:**
   * Deeply concerned
   * Numerous variety of bottom-up initiatives
   * No curb in global emissions growth

2. **Global community: UNFCCC & COP**
   Kyoto-Bali-Warshau: disconnecting from reality
   - Built on good intentions (interests hidden)
   - Unclear agency with world political leadership
   - Overly ambitious new instruments, institutions
   - High exposure attracts too many other agendas
   - Integrate, piggyback development & climate policy

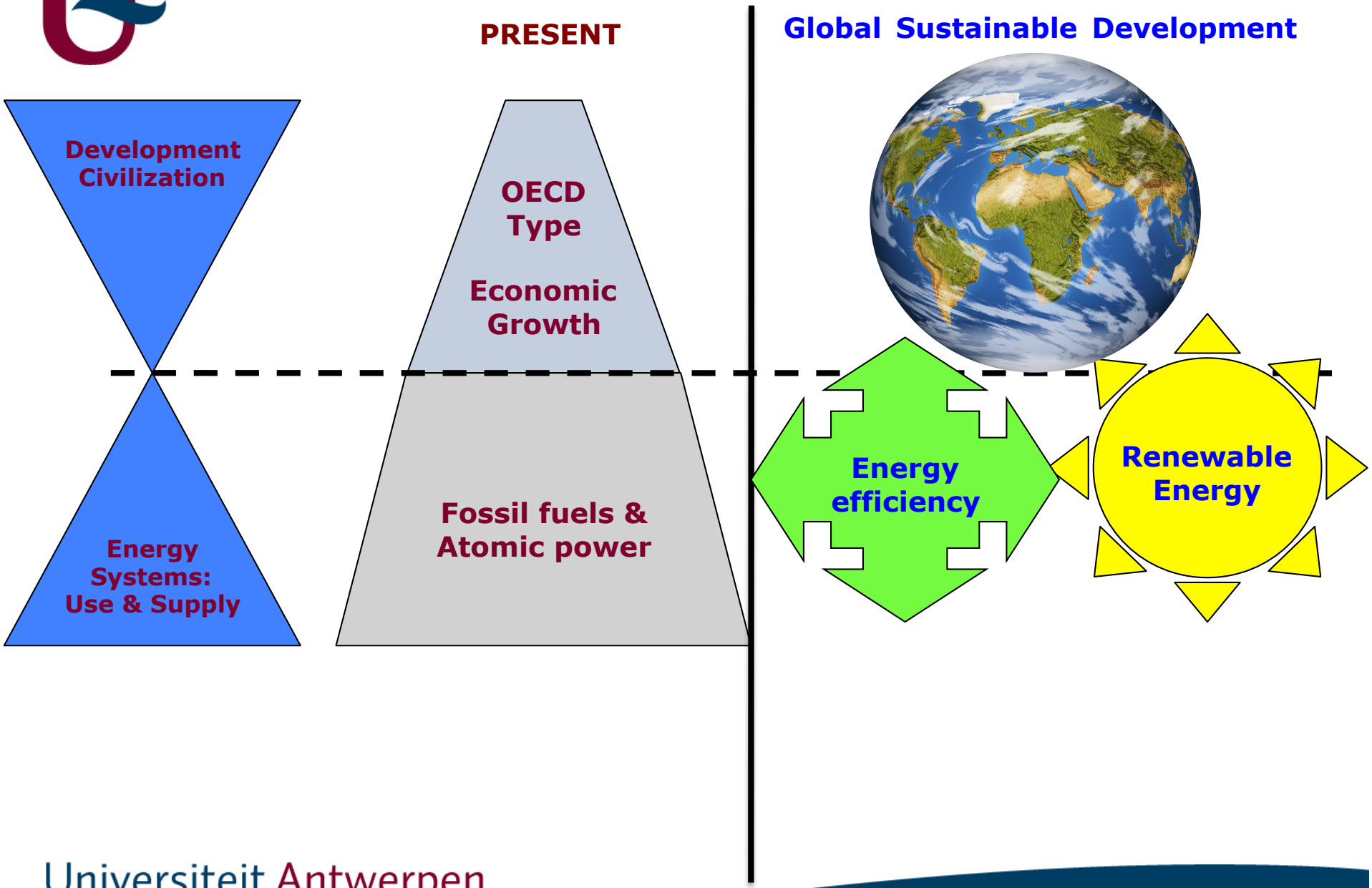
Top-down (UNFCCC) ⇔ Bottom-up (nations)

Kyoto extension ⇔ Polycentric Regime Complexes

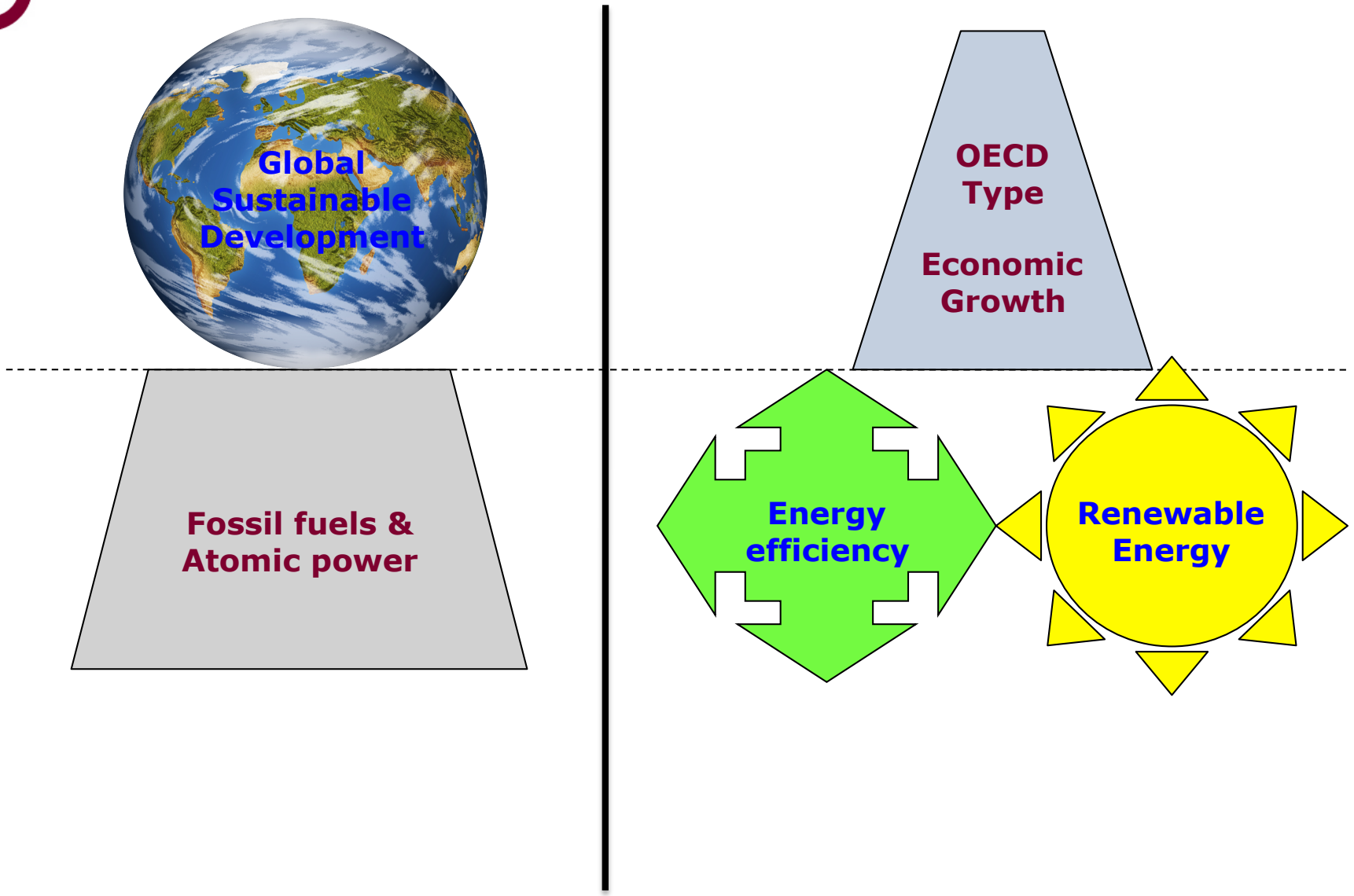
ENERGY: core of the problem



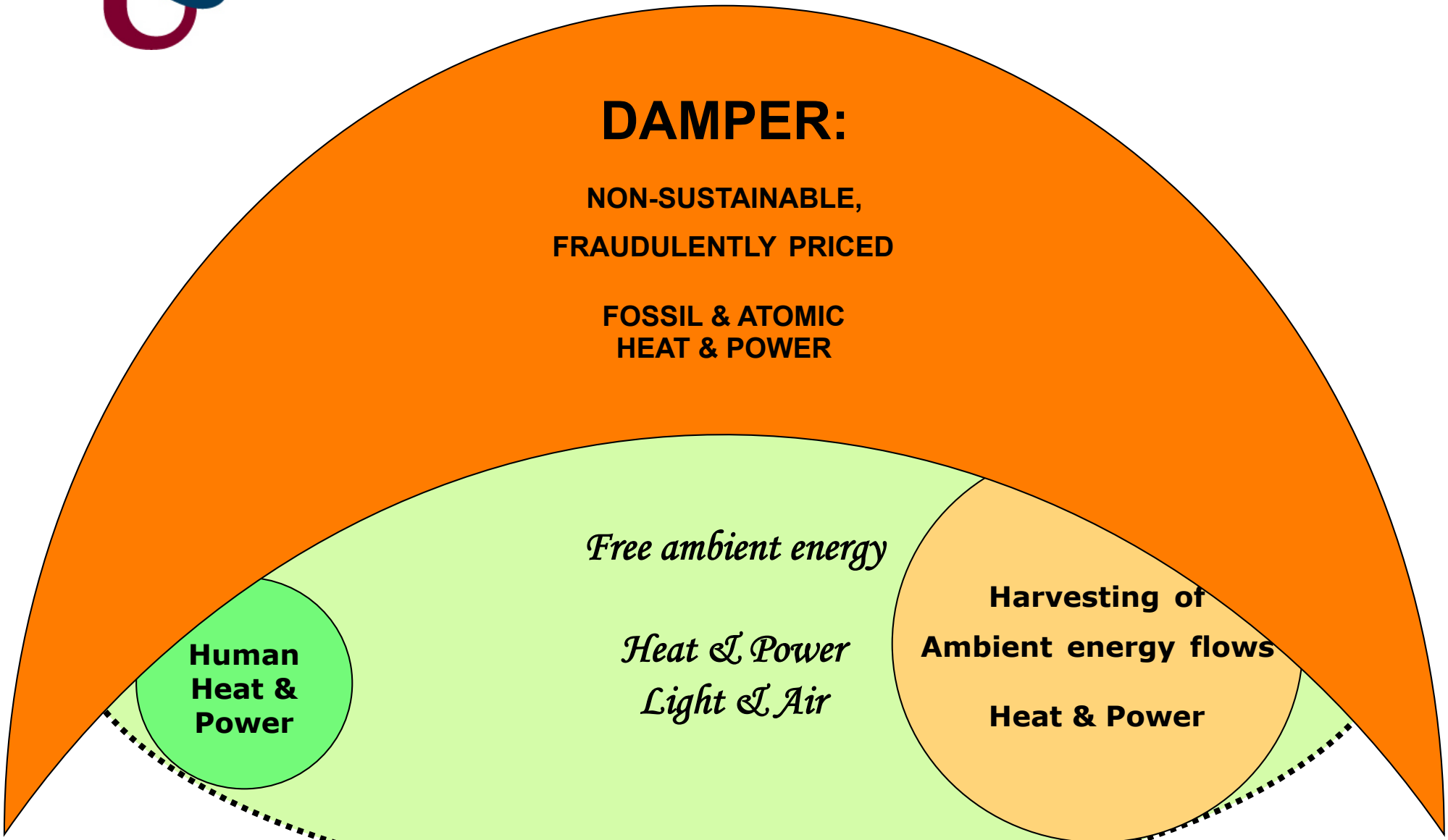
Energy substrate of development & civilization



Non-fitting energy substrate & societal constructs



Sustainable energy



Essence of Climate Policy

1. **Atmosphere is unique: its saving gets priority above everything else**
2. **The ultimate global commons need "mutual coercion, mutually agreed upon" – some global public policy**
3. **Excessive use of fossil fuels + atomic power: root cause of problems = Gordian knot of change [ban is necessary & sufficient, + condition for SD]**
4. **Build distributed, efficient, renewable, sustainable energy systems: responsibility of the rich - others will follow (emulate)**
5. **Trillions of decisions by billions of people, daily: decentralized policy reach is needed**

Five crucial principles merit respect

1. **Universality:** look at the world from the Universe

2. **Sovereignty:** of nations, organisations, people

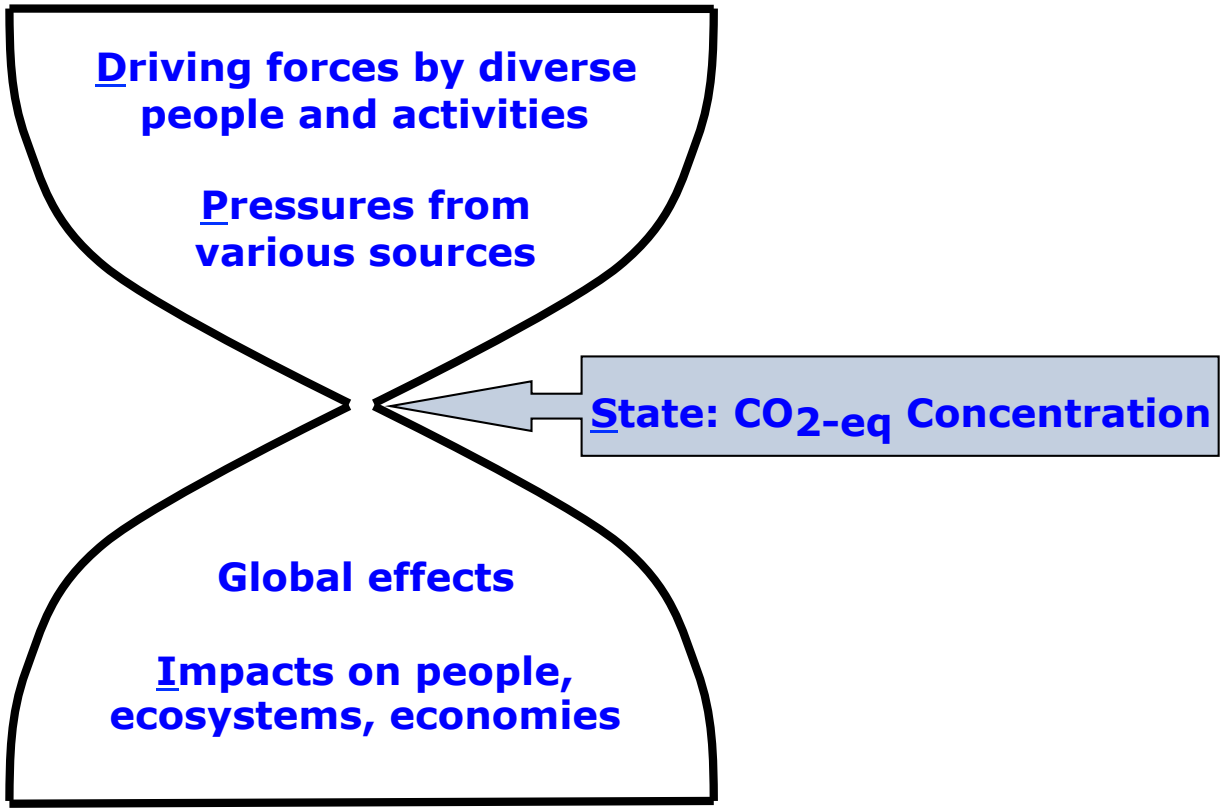
3. **Realism:**
   interests prevail over intentions
   find the fastest pace of change
   climate change threatens life (of the poor)

4. **Transparency:** comprehensible + clear metrics

5. **Diversity:**
   real world is diverse
   policy specificity is crucial
   avoid discrimination type II

Belief in supremacy of uniform approach

Hourglass structure of Climate Change in the framework Driving forces – Pressures – State – Impacts [DPSI]



Issues to address

1. **Urgency:** deliver by performing institutions, trained & experienced people, proven data, established MRV, …

2. **Global commons:** needs global treaty; but also nested, polycentric governance; respect & deploy diversity

3. **Top-down (gothic cathedral) ⇔ Bottom-up (favela):** Urban Planning = light common framework + decentralize construction works

4. **Time-sequential decision-making:** start here & now, rolling baselines, irrevocable yearly progress, flexibility and adaptability

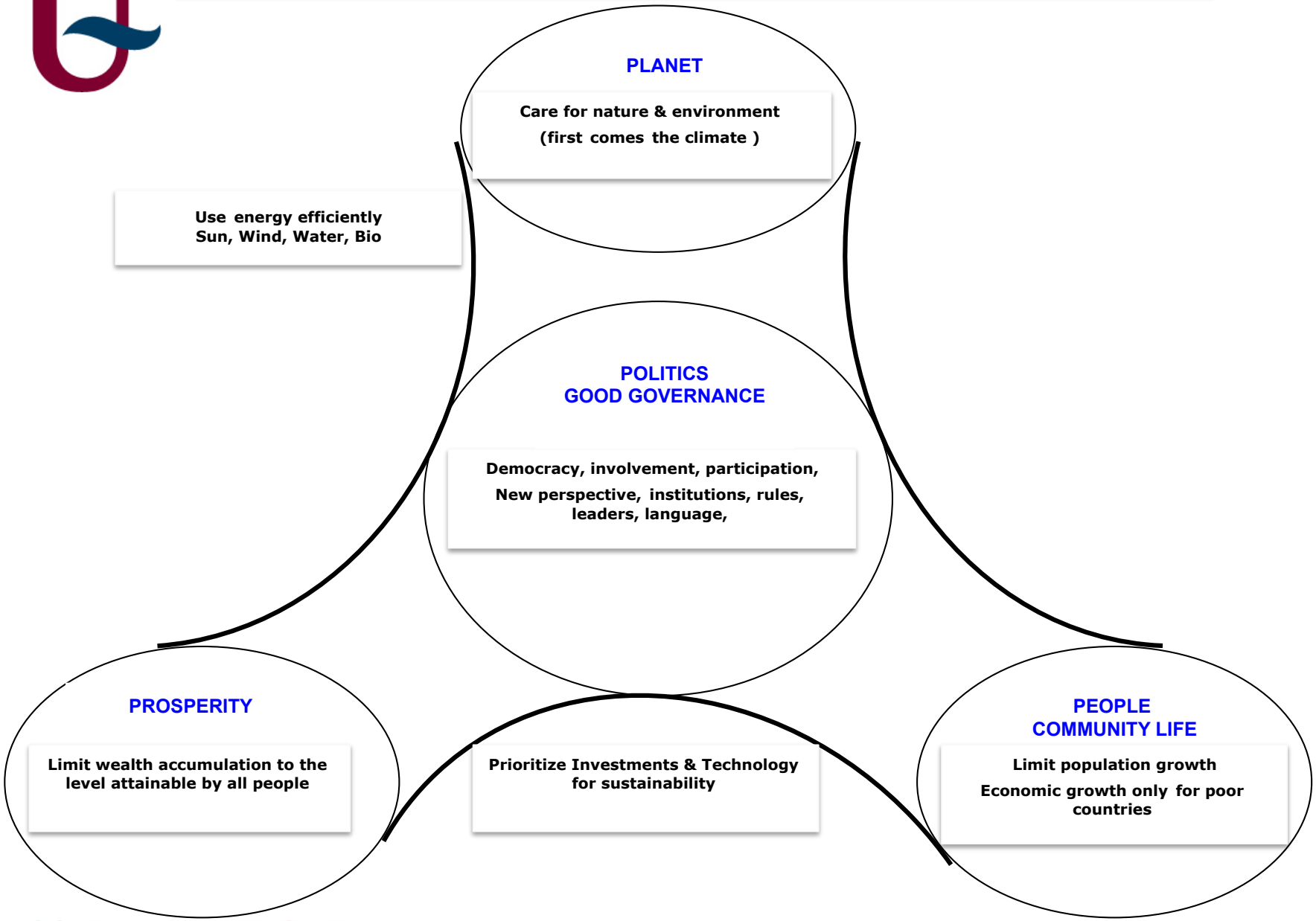
5. **Incentivize interests:**
   * boost national budget reforms (levies; subsidies)
   * yearly transfers based on GDP/person & on measured progress in mastering emission drivers

Rationally Radical

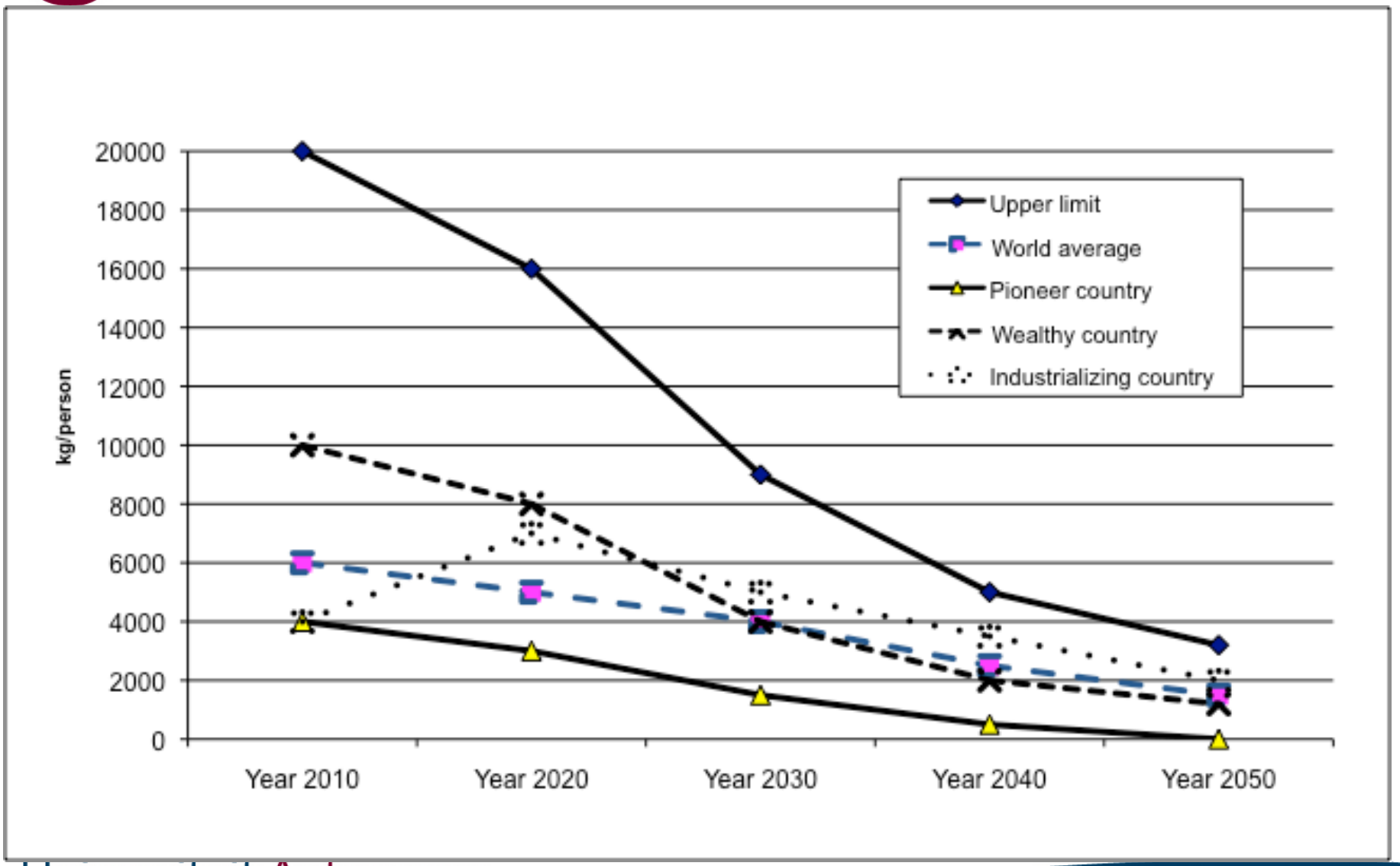
- **RADICAL = Sustainable Development**
  = Urgent & Drastic Change ⇔ Business-as-usual

- **RATIONAL**
  - **NO 'new humankind' experiments**
  - **Reform GDP (activities x prices)**
  - **Bypass the energy "Pantheon"**
  - **Rebuild energy systems; civilization will follow**
  - **Dump old solutions, guides, language, …**
  - **Reveal interests, instruments, mechanisms, … that allocate money, power, influence, …**

Sustainable Development



Serious about +2°C = every country limits emissions/person = stop offsets



Decompose emissions/person in drivers

DRIVERS of energy related CO_2 emissions:

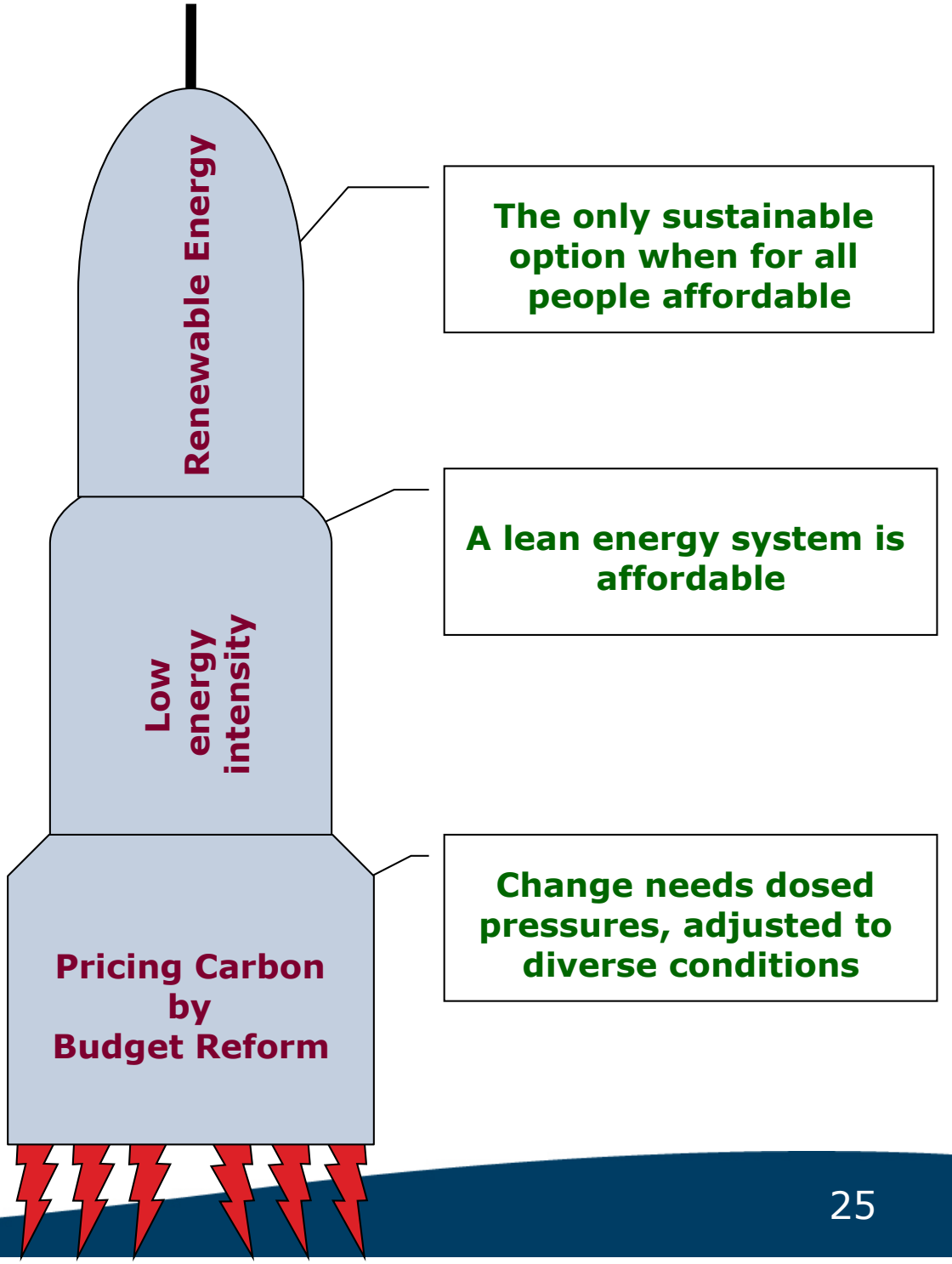
$$\frac{CO_2 \text{ emissions}}{\text{Person}} = \frac{\$ \text{ GDP}}{\text{Person}} \times \frac{\text{kWh energy}}{\$ \text{ GDP}} \times \frac{CO_2 \text{ emissions}}{\text{kWh energy}}$$

Start and foundation of diverse policies,

targeting the levers of change

Blow up the climate gridlock by

3-staged rockets



Decompose drivers in activities & actors, down to specific units of policy address

Wealth Intensity of Peoples (prices & activities & who?)

$$\text{Wealth Intensity} = \frac{\$\ \text{GDP}}{\text{Person}} = \sum_{A} \frac{P_A \text{ x Activity}_A}{\text{Person}} \qquad (3)$$

Energy Intensity of Wealth (budget shares & efficiency)

$$\text{Energy Intensity} = \frac{\text{kWh energy}}{\$\ \text{GDP}} = \sum_{A} \frac{P_A \text{ x Activity}_A}{\$\ \text{GDP}} \text{ x } \frac{\text{kWh energy}}{P_A \text{ x Activity}_A} \qquad (4)$$

CO_2 emissions Intensity of Energy (energy mixes)

$$CO_2 \text{ Intensity} = \frac{CO_2 \text{ emissions}}{\text{kWh energy}} = \sum_{E} \frac{\text{kWh type}_E}{\text{kWh energy}} \text{ x } \frac{CO_2 \text{ emissions}}{\text{kWh type}_E} \qquad (5)$$

National Budget reform: indicator by 4 factors of measured "climate tax/subsidy revenues"

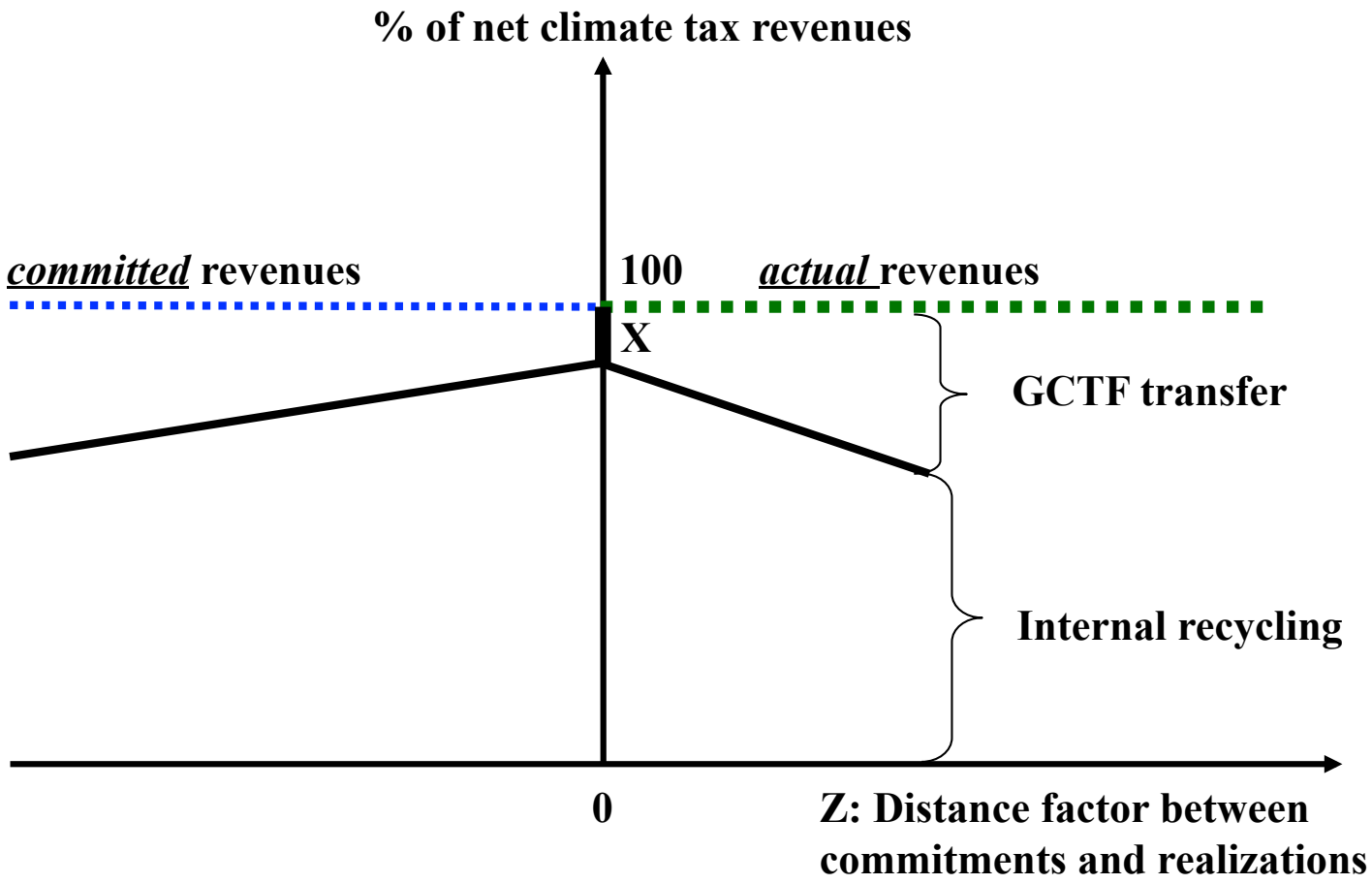
	"Goods"	"Bads"
Levies, charges, taxes	B1-	B2+
Subsidies, support, feed-in tariffs	B3+	B4-

Variable = (B2 + B3) – (B1+B4) in $, €, £, …

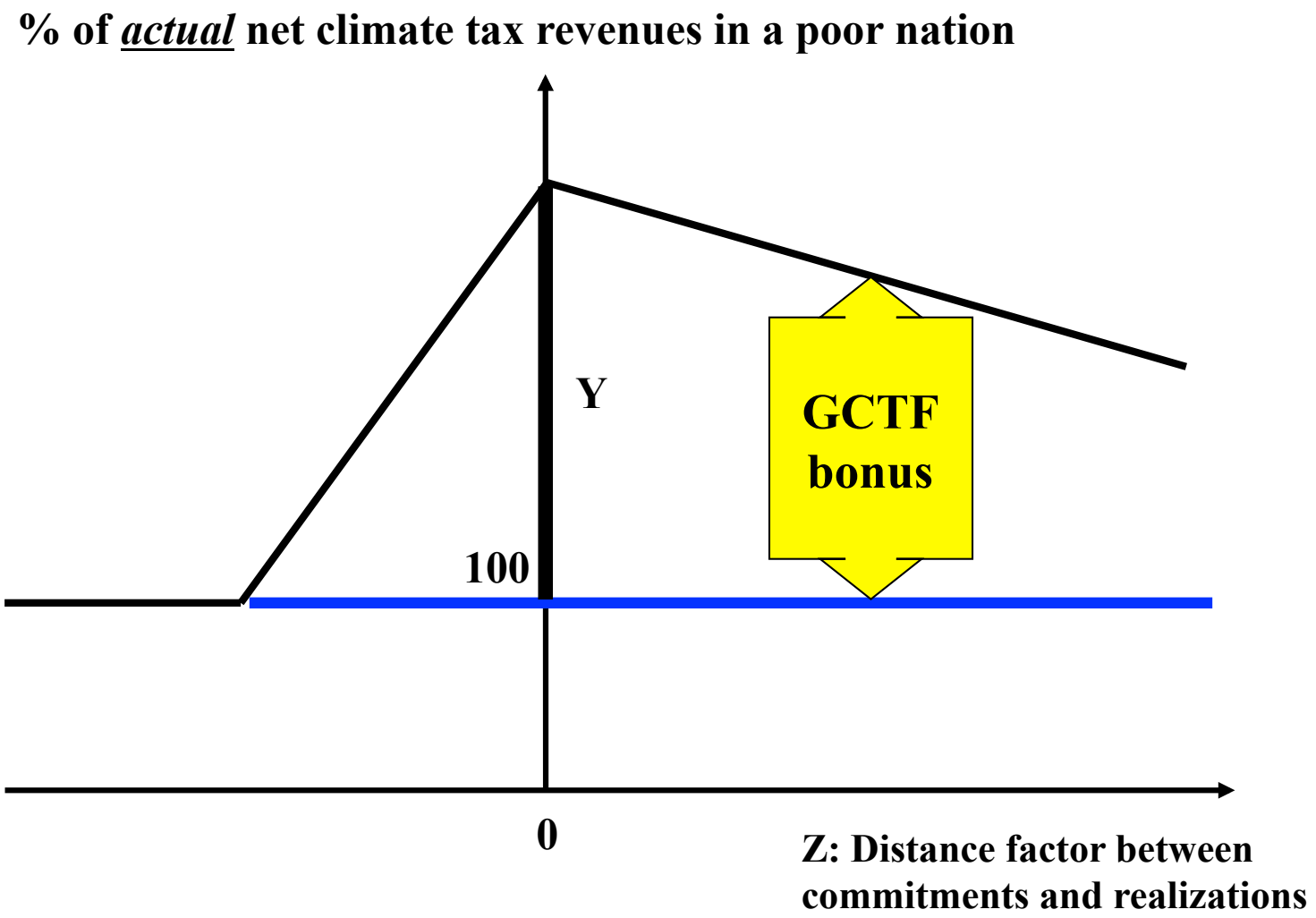
Components of alternative policy

- **Top-down (UNFCCC) & Bottom-up (nations)**
  - Comprehensive UNFCCC framework
  - Subsidiarity to nations and their constituencies
  - Sectoral approaches for global industrial activities
- **Pledges with yearly review on rolling baselines**
  - Yearly Progress on Intensity indicators, known today
  - MRV by yearly statistics provided by IMF, IEA, UNDP
- **Carbon emissions pricing instruments**
  - Domestic Budget/Tax Reforms Enhanced
- **Transfers from Rich to Poor nations**
  - Graduation by GDP/person metrics
  - Yearly payments or receipts based on GDP/person
  - Performance adjusted payments & receipts

Rich nations fund GCTF (Global Climate Transfer Fund) X depends on GDP/person



Poor nations get GCTF bonus
Y depends on GDP/person



Follow the alternative path

1. **Common Resolve Emulation (⇔ Zero-sum)**
   Team spirit, mutual learning, try to excel

2. **All countries equal at UN-level**
   First agreement among the big emitters + join-ins

3. **Goal directions >>targets; Practices >>projects**
   Irrevocable decrease emissions/person over 2010-2050

4. **Yearly Progress by country on 3 indicators**
   Reduction of non-sustainable energy intensity
   Increased use of sustainable renewable energy
   Restructure GDP by Budget REFORM + global industrial sector policies (eventual sectoral emissions trading)

5. **Structured transfers from rich to poor, based on**
   GDP/person & country performance on indicators

Overhaul COP – save UNFCCC

1. **End Kyoto protocol logic; take a fresh approach**
   - **Distributed renewable energy & efficiency as *spearheads* of related societal power and true change**

2. **Limit UNFCCC to Climate Issues; end COP circus**
   - **UNFCCC at fixed seat, e.g. Addis Ababa, Bonn, …**
   - **Experts in climate, energy, impacts, adaptation, … cooperating with existing institutes**
   - **Main focus on Parties' home work (multi-level governance)**

3. **Support separate UN initiatives on other major issues**
   - **Refresh debate on population, demography, migration,…**
   - **Technology transfers (property rights; patents)**
   - **ETHICS commission on wealth accumulation, redistribution and equity**

Conclusions

1. **Kyoto-Bali-Warschau-Lima fails / falters**
2. **Solid ways are open**

- **Yearly progress on country measured indicators**
  - **Reduced energy intensities**
  - **Increased use of renewable energy**
  - **Budget REFORM by country**
- **Structured transfers from rich to poor**
  - **Based on GDP/person + performance on indicators**
  - **Contraction & Convergence of emissions/person**

3. **Prices show the way**
   - **Not the unicorn tax or ETS of economic theory**
   - **But: fine-tuned pressures ≈ carrying capacity (effective, efficient, fair, feasible)**