Policy instruments for Promoting Adaptation and the Sharing of Climate Change Related Risks

June 7, 2011

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Agenda

- **Background and objectives**

  Overview of potential economic instruments for adaptation

  Sonja Butzengeiger-Geyer, Perspectives

- **Selected instruments: Water pricing, Payments for Ecosystem (PES), Land use taxes, Concessional loans**

  Sonja Butzengeiger-Geyer

- **Adaptation Market Mechanism**

  Michel Köhler, Perspectives

- **Risk Financing Instruments**

  Reinhard Mechler (IIASA) / Sonja Butzengeiger-Geyer, Perspectives

- **Comments by Sven Harmeling, Germanwatch**

- **Discussion**

Background of our work & objectives of the side event

Objectives of our work

- **Study for the EU COM (ongoing)**
  - **Identify and evaluate economic instruments for**
    - Promotion of adaptation in the EU
    - Risk sharing and transfer
  - **Scope**
    - Review of existing EIs
    - Selection of EI for further analysis (general applicability)
    - Development of proposal for innovative EI: AMM
    - Evaluation of shortlisted EI
    - Feedback from experts
    - Policy recommendations

Preliminary findings; No reflection of EU position

- **Objectives of this side event**
  - Present selected EI for promotion of adaptation and risk financing
  - Feedback & open discussion for consideration in the policy recommendations

Overview of use of economic instruments

Categorization of policy instruments for EU project

	Policy instrument category	Subcategories
MBIs	Subsidies	Grants; tax reductions; price supports
MBIs	Taxes and fees	Carbon taxes; land taxes and fees; energy taxes
MBIs	Licences, permits and variations	Tradable units; project based offsets; adaptation market mechanism ; advance market commitment
MBIs	Other Market Based Instruments	Payments for ecosystem services; water markets; habitat banking
MBIs	Public Private Partnerships (PPPs)	Public contracts; service concessions; joint technology initiatives; financial instruments
RFIs	Risk Financing Instruments (RFIs)	Insurance; catastrophe bonds; weather derivatives

Shortlisted economic instruments for further evaluation

Policy instrument category	Selected subcategories for further analysis
Subsidies	- Grants - Tax reductions
Taxes and fees	- Land taxes and fees
Licences, permits and variations	- Adaptation market mechanism
Other Market Based Instruments	- Water markets - PES
Public Private Partnerships (PPPs)	- Financial instruments: Loans - Financial instruments: Guarantees

Shortlisted economic instruments for further evaluation

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Subsidies	- Grants - Tax reductions
Taxes and fees	- Land taxes and fees
Licences, permits and variations	- **Adaptation market mechanism**
Other Market Based Instruments	- **Water markets** - PES
Public Private Partnerships (PPPs)	- **Financial instruments: Loans** - Financial instruments: Guarantees

Evaluation criteria

Applicability:

- Applicability of the EI to incentivize adaptation
- Institutional feasibility
- Consistency with other policy instruments
- Acceptability to interest groups

Effectiveness:

- Effectiveness for incentivising a desired adaptation outcome

Efficiency:

- With what resources can an instrument achieve the objective?
- What transaction costs will accrue?

Equity: What distributional consequences will arise?

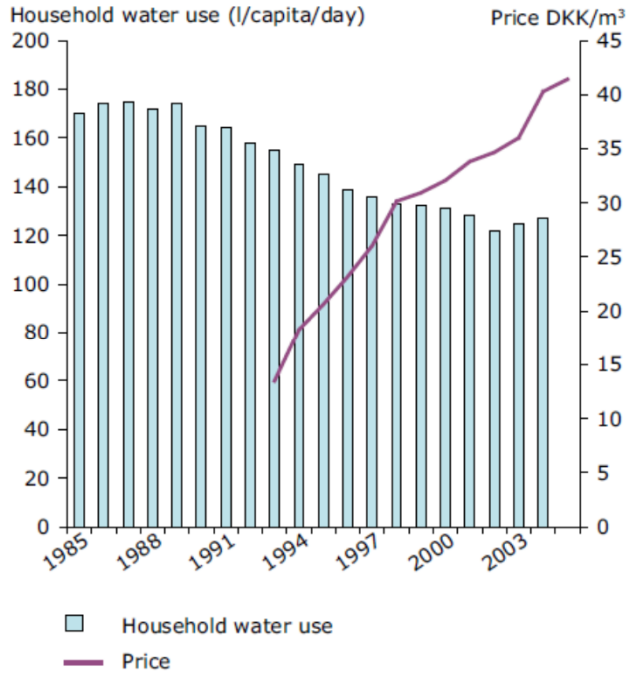
Conditions and barriers

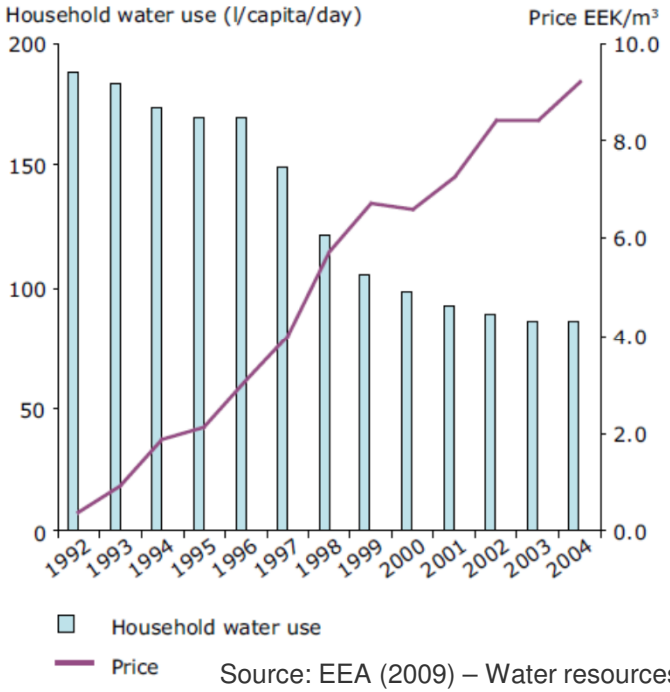
Economic Instrument: Water pricing

Water markets

The starting point:

The overwhelming and unsurprising empirical evidence shows that pricing water (or rather rising costs for using water) sets incentives to save water.





Source: EEA (2009) – Water resources across Europe, p. 35.

- In our understanding water markets simply mean that **efficient water prices** are needed → full cost pricing! (not current practice...)

perspectives climate change

Instruments to promote adaptation

Water markets

Justification in the context of adaptation:

- Water is an increasingly scarce resource in many world regions.
- Climate change will exacerbate water scarcity (regionally and seasonally).

Purpose:

- Water prices set incentives for efficient use.
- Water taxes could serve as a proxy (for some cost components) where efficient prices are difficult to implement.

Forms	Aim
Water pricing	Incentivize thrifty use, i.e. reduce water demand
Water taxes	
Grants for water saving activities / measures	

Instruments to promote adaptation

Water markets

	Applicability	Effectiveness	Efficiency	Equity
Water pricing	High.	High.	High.	Depends on the judgement about the re-distribution.
Water taxes	High.	High.	Medium.	Depends on the judgement about the re-distribution.
Grants for implementation of water saving technologies	High.	Medium.	Low.	Depends on the judgement about the redistribution and the sources of funding.

Water markets

- **Challenges**
  - Water pricing could cause social hardships.
  - Some sectors, e.g. agriculture, would suffer disproportionately.

  → But: some change will be needed!

  → Option to carefully(!) compensate poor social groups through tax revenue

- **Conclusions**
  - Water pricing is inevitable.
  - Prices should reflect the whole costs of water and need to be charged according to volume consumed.
  - If efficient water pricing is for some reason not possible, water use should be taxed (regionally, seasonally). The revenues could be used to subsidize the implementation of water saving technologies.

Economic Instrument: Concessional loans

Concessional loans / guarantees

Purpose:

- Make loan available to finance adaptation activities
- Reduce costs of loans that are available on the regular financial market
    a) Reduce risk premium for default risk
    b) Reduce interest rates for project developers

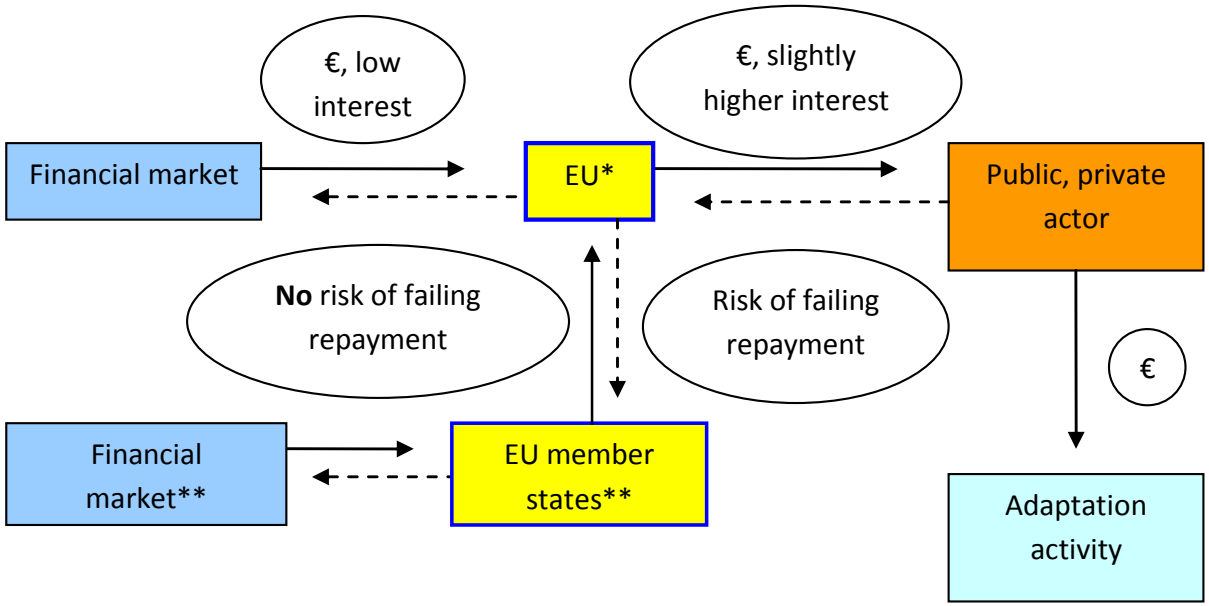
→ Incentivize additional adaptation actions

Justification in the context of adaptation:

Major investment barrier	Small and private investors	Large corporate investors
Investments with financial return	**Accessibility of loan**	**High interest rates** (only if return if investment is at the margin of profitability)
Investments without financial return	**Investment per se**	**Investment per se** (but potentially higher willingness to invest in cases with clear, predictable damage potential)

Instruments to promote adaptation

Concessional loans – Working principle



*) including intermediaries like EIB

Forms	Effect
Direct loans from EU budget	Max. cap of loans is lower, refinancing through taxes/own resources required.
Loans financed by member states	Higher interest rates likely (some MS have lower ranking) or tax increase required.
Raised funds from the financial market	No public budget required, EU budget only serves as collateral for credit defaults.
	Max. cap might be relatively high.

Concessional loans

Possible applications in the context of adaptation:

- Loans could be used in all aspects of adaptation to climate change where firms are involved as a potential sufferer from climate change impacts.

Among the wide variety of possibilities:

- Climate-proofing of production processes and chains
- Climate-proofing and resiliency against extreme events in buildings
  - Heating/cooling of buildings
- Use of new technologies in agriculture, e.g. implementation of higher water-efficiency
- Research and development

Concessional loans

Challenges:

- Often adaptation actions do not generate direct monetary revenues
  → Return is uncertain/non-existent
  → Unlikely that improving loan availability/slight improvement of loan conditions will increase investments in adaptation.

- Politicians would need to agree on a loan funding structure and the related collateral (e.g. EU budget). As usually no revenues are created, there default risk needs to be considered carefully. Capacity to assess risk has to be built up within the lending institution (e.g. EU).

- The allocation of loans needs to be tied to the specific adaptive action. Lobbies might try to favour certain target groups.

Concessional loans

Conclusions

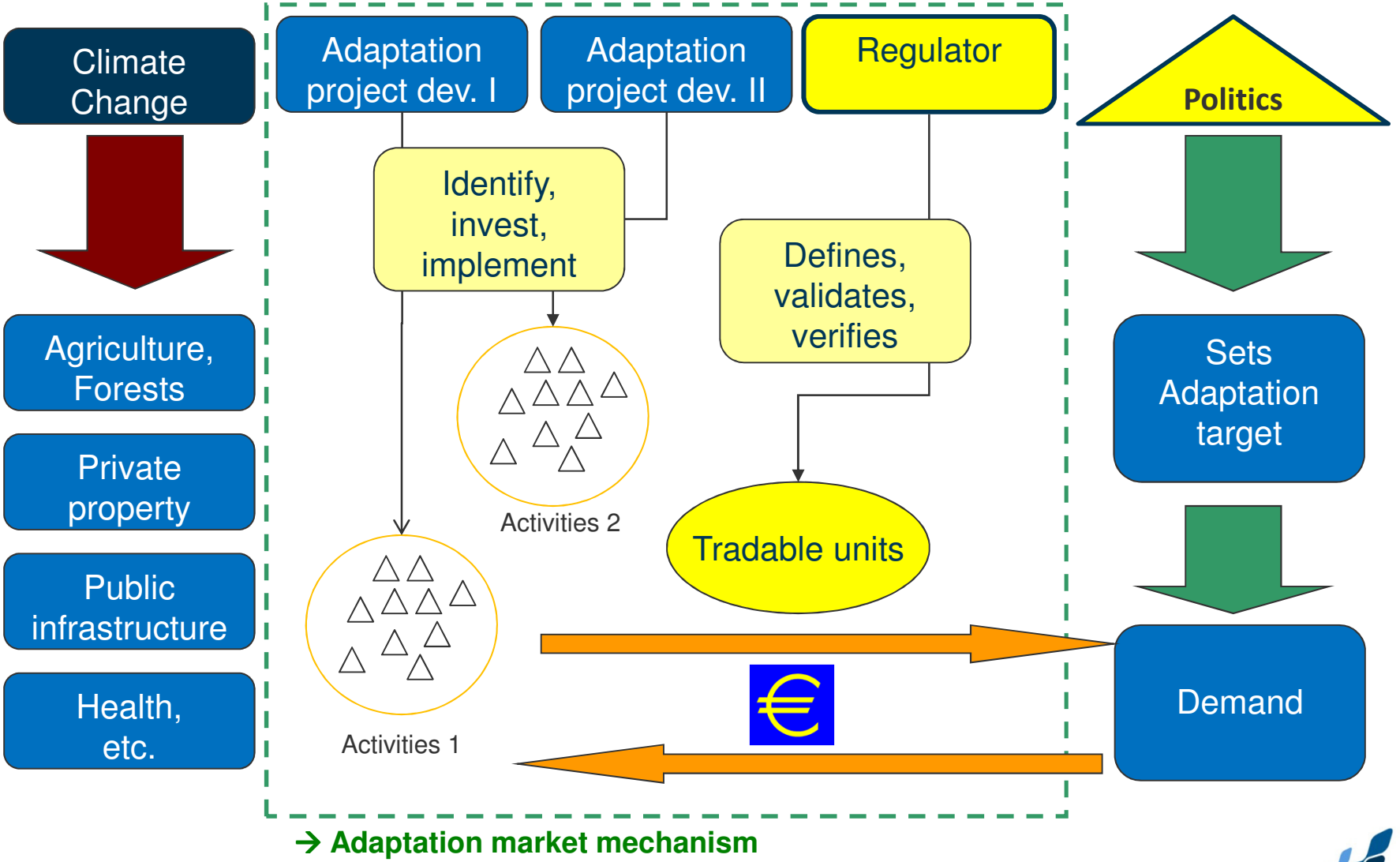
- Loans are able to support actors that have identified adaptation needs but cannot afford high interest rates.

- To trigger adaptation for groups without urgent interest in adaptation activity, a combination of loans and grants might be useful.

- If the EU offers low interest rates, public institutions in countries with lower ranking on the financial market might be interested as well (public-public partnerships).

Innovative economic instrument: Adaptation Market Mechanism

General concept of an AMM



Licenses & tradable permits: AMM

Justification in the context of adaptation:

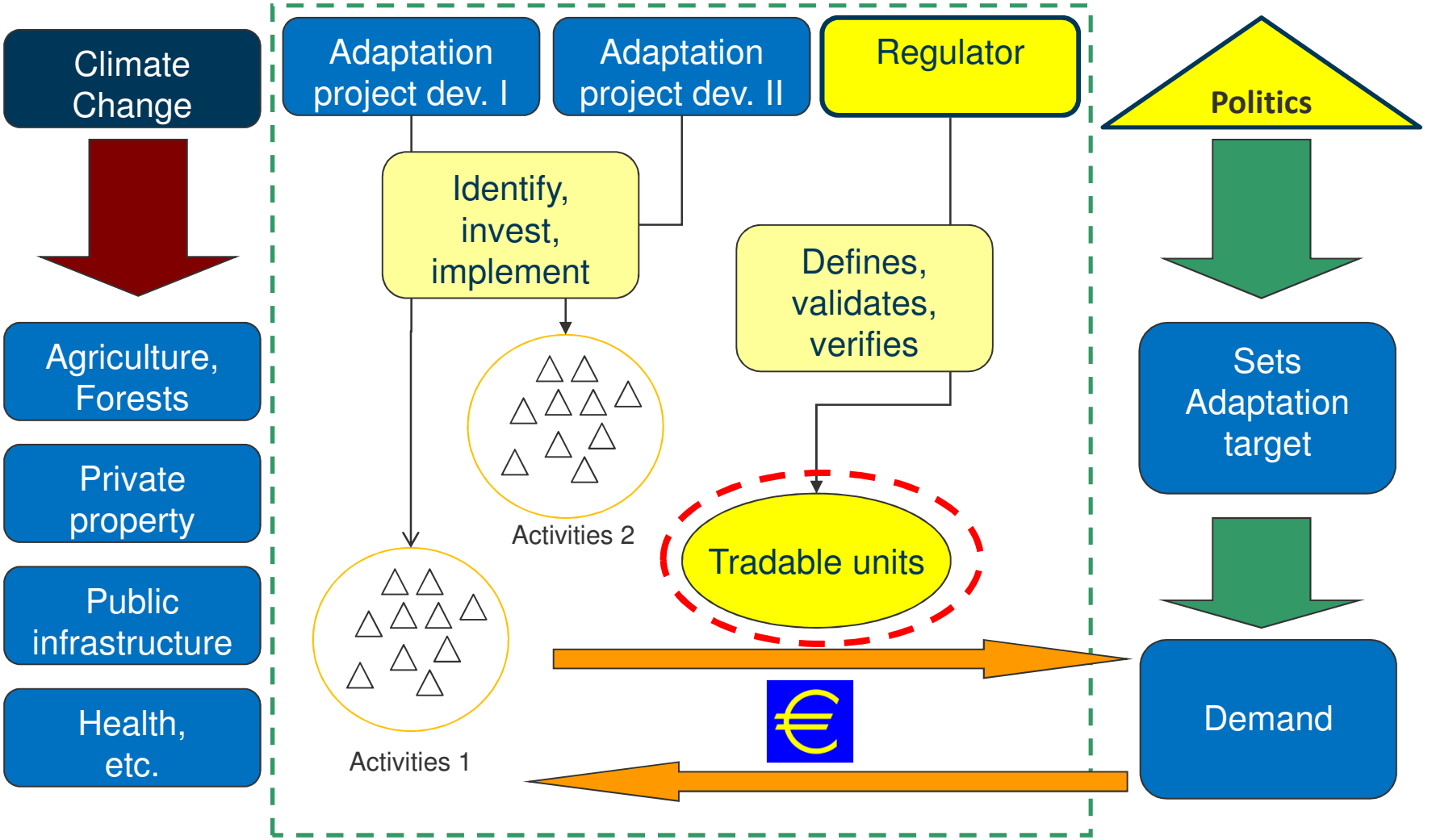
- Cost-effective and economically efficient approach: the market identifies the most efficient activities over all participating “sectors”
- Tradable units standardize adaptation benefits and enable comparability.
- Costs can be allocated to responsible actors (public and private).
- Adaptation targets can be set by EU or its member states.

Purpose:

- Promote efficient adaptation.
- Guarantee transparency.
- Strong involvement of private sector, eventually allocation of contributions according to responsibility for climate change (GHG emissions).

AMM:

Definition of trading unit



Background: Adaptive effects in literature

- **How to define a universal trading unit for adaptation?**
- **Literature: Disaggregate measurement of effect by sector**

  -> various different indicators are proposed

  -> *allows no comparison, markets need comparable units.*

  OR

- **Monetize different impacts**

  -> but:

  - Human lives are difficult to monetize

  -> *Unsatisfactory situation for policy makers – how to allocate scarce financial resources?*

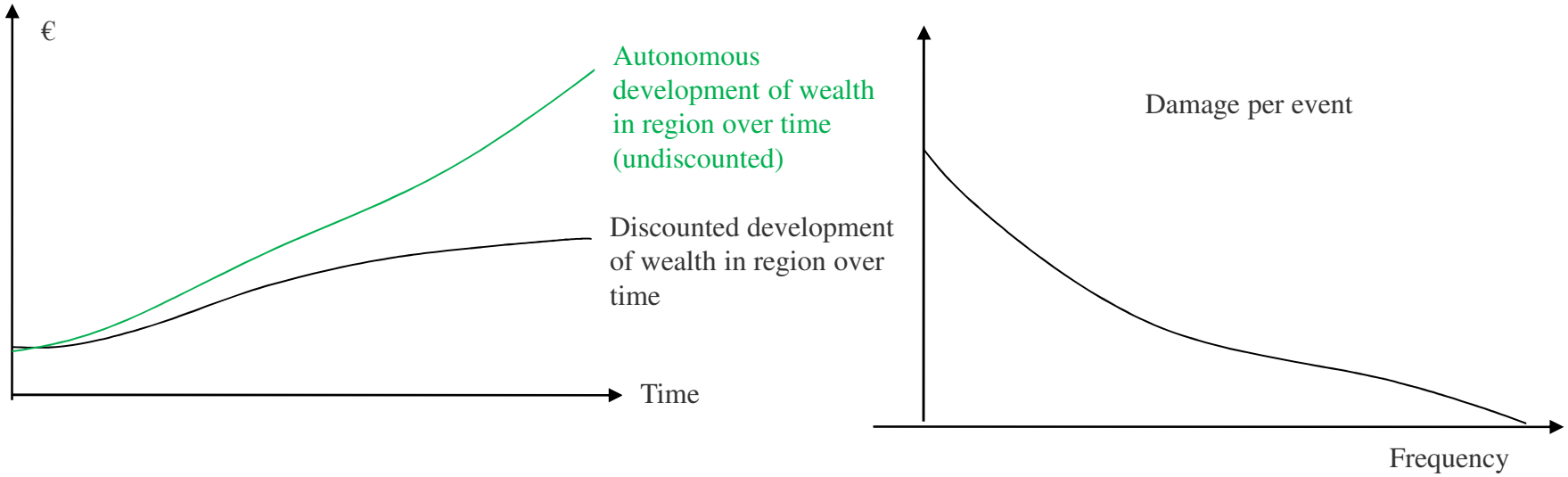
Evaluating adaptation effectiveness

- Assess adaptive benefit of actual investment projects/programmes by definition of tradable units:
  - **Saved Wealth (SW)**
  - **Saved Health (SH)**

- Learn from mitigation effectiveness assessment
  - Universal parameter is crucial
  - Methodologies for baseline assessment and monitoring

Indicator: Saved Wealth (SW)

- Applied for:
  - Public infrastructure
  - Private property
- Natural resources and services are included in public property
- Frequency distribution of damage from climate change driven extreme events taken into account



Indicator: Saved Wealth (SW)

- Purchasing Power Parity to be used
- Four possible concepts with advantages and disadvantages:

Concept	Advantages	Disadvantages
Absolute wealth (in €)	Easy to measure	Benefits rich (countries)
Relative wealth saved (aggregate level)	Funds to poorest countries (or regions…)	Not necessarily most vulnerable persons
Relative wealth saved (individual level)	Close to vulnerability	Data access
Wealth below the subsistence level (in €)	Close to vulnerability	Subsistence level definition Data availability?

Indicator: Saved Health (SH)

- Independent indicator for human life without monetary valuation avoids ethical challanges
- New approach based on WHO-standard Disability Adjusted Life Years Saved (DALYs)
  - Enhancement of DALYs to avoid discounting and age weighting

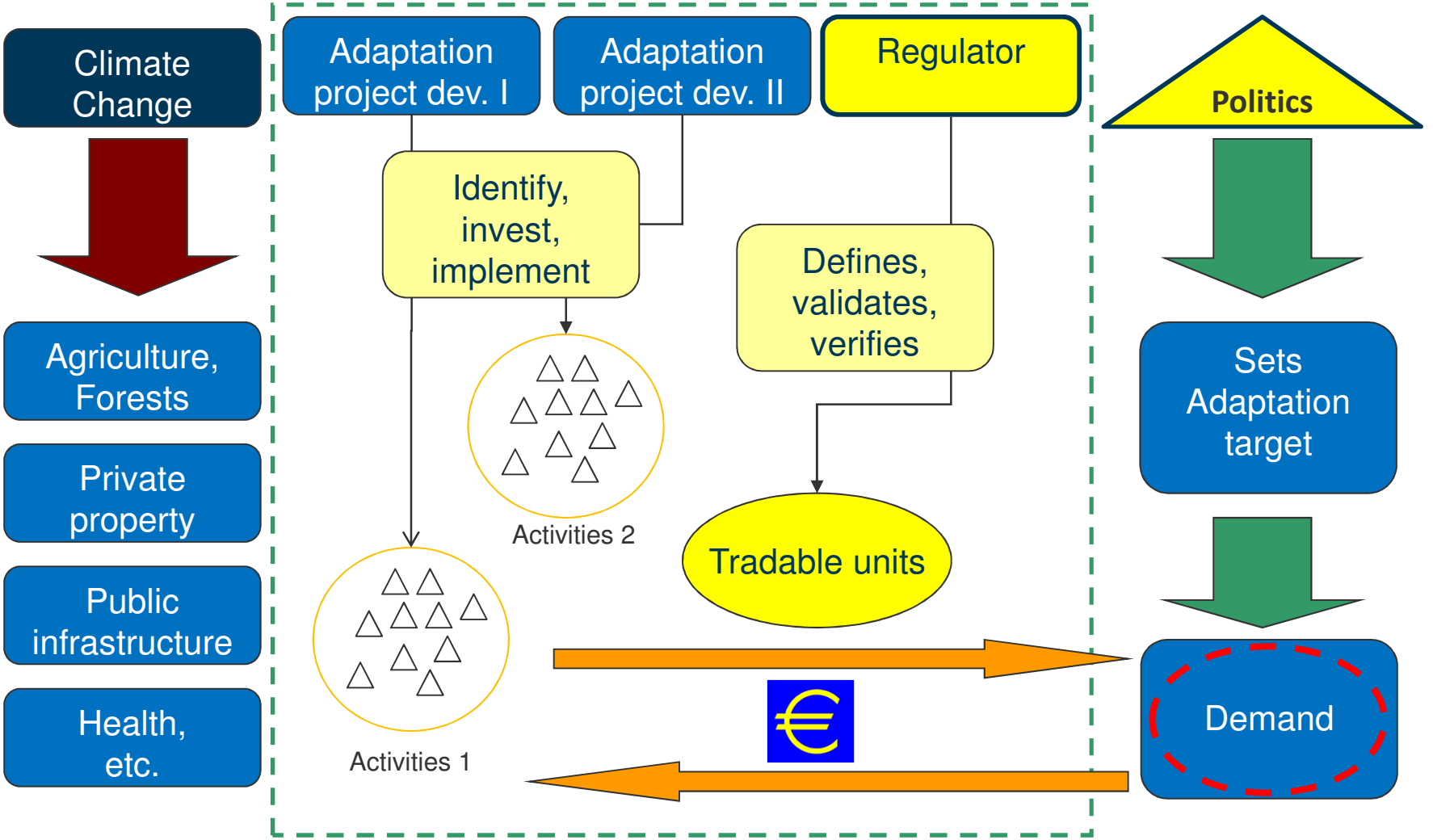
$$DALY_{cc} = YLL + YLD$$

YLL: years of life lost due to premature mortality

YLD: years lived with disability

AMM:

Definition of demand



→ **Adaptation market mechanism**

AMM:

Definition of demand

- Option 1.) EU itself buys units (taxpayers)

- Option 2.) Member States buy units (taxpayers)

- Option 3.) Polluter pays principle:
  - GHG emitters are obliged to comply with their adaptation targets
  - They might buy adaptation units on the market or implement own projects
  - Entities could be identified from e.g. the existing EU-ETS
  - Costs would be passed through to end-users

- Other options, e.g.:
  - size of company (revenue, number of employees),
  - general tax

Challenges for introducing an AMM

- Allocating targets might be a highly political process without precise knowledge about future impacts of climate change.
- Definition of the demand for adaptation units is critical. If the “polluters pays“ option is chosen, heavy lobbying of emitters can be expected.
- Under uncertain climate change projections, a consistent estimate of the level of adaptation units across adaptation projects of strongly differing design and lifetime is very difficult -> might lead to inefficient spending.
- Assessment of the prevention of climate impacts through a certain technological intervention may be difficult.

The regulator needs to be impartial and uphold “adaptation integrity”.