



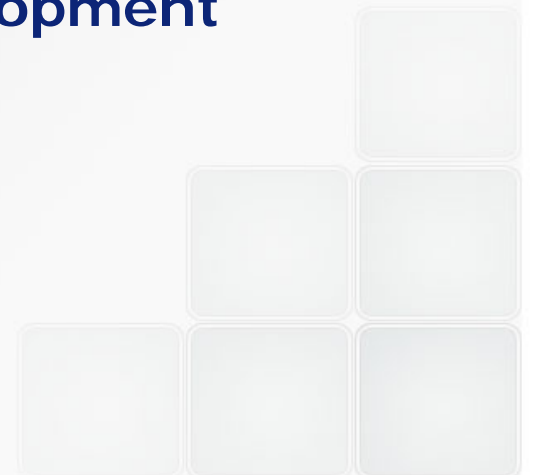
# ***A NOVEL MODEL OF GHGs EMISSION FISCALITY: PROs and CONs***

Sergio La Motta

**ENEA**

**Italian National Agency for New Technologies,  
Energy and Sustainable Economic Development**

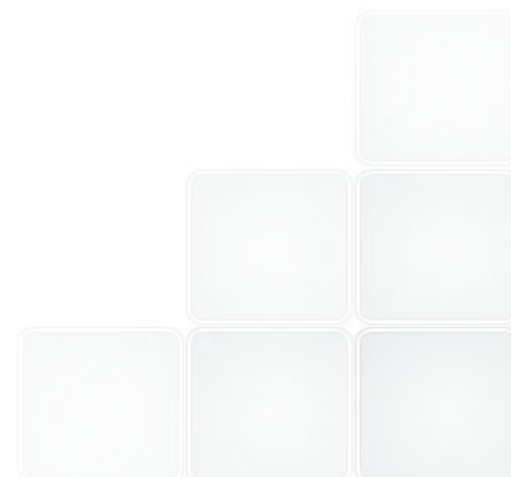
**Low Carbon Society – Rnet  
Doha, 27 nov. 2012**



# Structure of the presentation



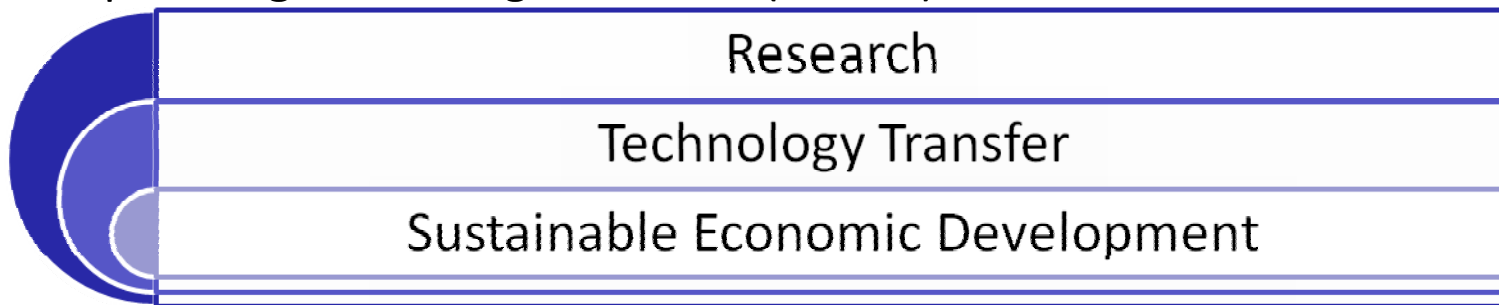
1. **ENEA in brief**
2. Description of a new GHG emission fiscalilty:  
Carbon Added Tax (CAT) - analogies with VAT
3. Pros and cons of the mechanism
4. Conclusions



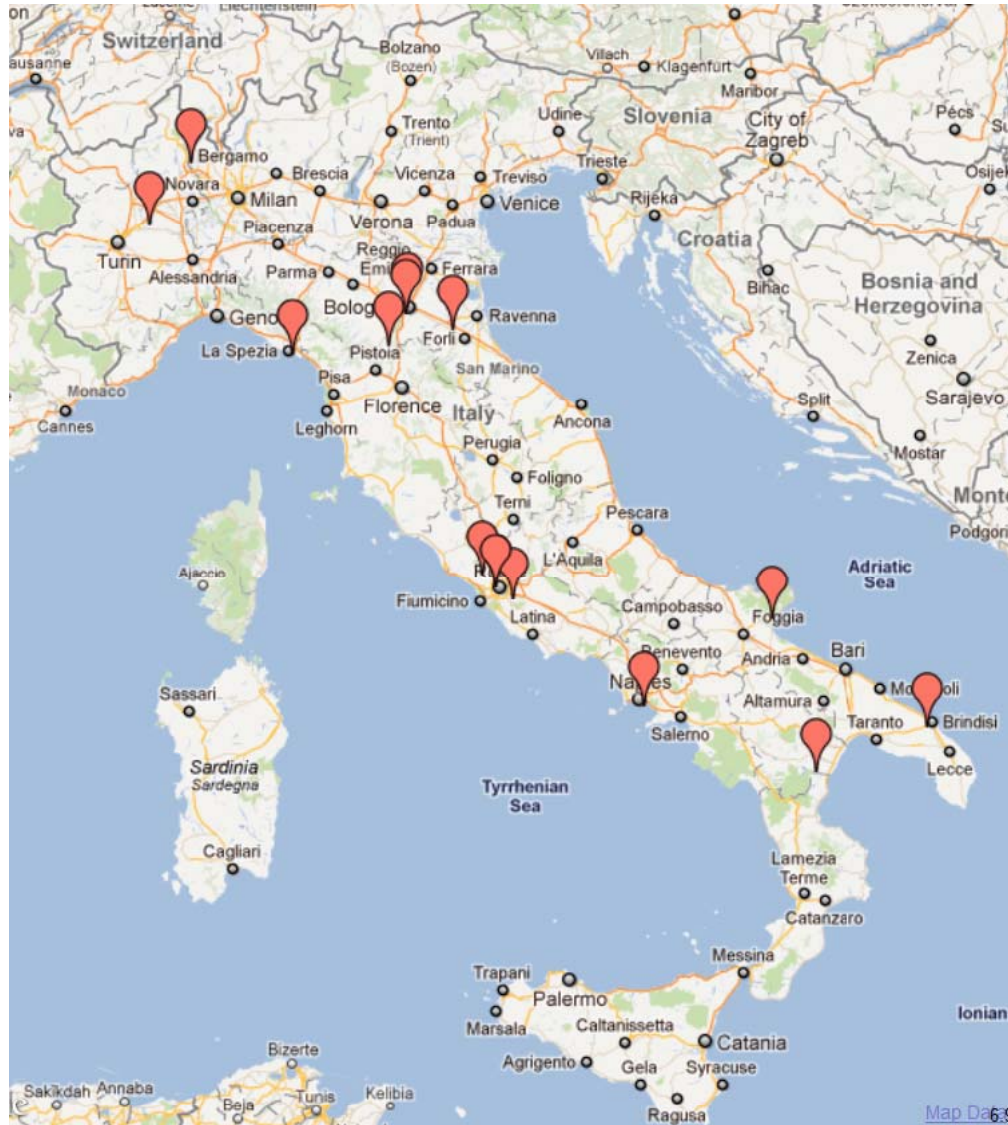
# ENEA's history



- ENEA was founded in 1952, as the National Committee for Nuclear Research (CNRN), with the specific objective of studying the multiple applications of nuclear energy for civil purposes, e.g. biological and agricultural sciences, physics and electronics
- In the 60es, the Italian government donated one of CNEN's research centres to the European Community (Ispra site – hosting 4 JRC's Institutes) and changes CNRN's name into CNEN (National Committee for Nuclear Energy)
- In 1982, CNEN becomes ENEA and deals from now on with RES, energy efficiency and environmental impact
- After the Chernobyl disaster, in 1987 through a referendum Italy decides to quit nuclear technology for power generation purposes: in 1991, ENEA's research activities are partially re-directed towards RES, Environment and New Technologies, including research on nuclear fission and fusion
- In 2009, ENEA becomes an Agency of the Ministry of Economic Development, with the aim of pursuing, according to Law 99 (art. 37):



# Facts and Figures



## Human Resources:

**2640 permanent staff**  
**Master and PhD students**  
**International Fellows**

## Infrastructures

**Headquarters located in Rome**  
**9 Research Centres**  
**5 Research Laboratories**  
**43 pilot plants and research facilities**  
**11 Local Offices**  
**Brussels Liason Office**

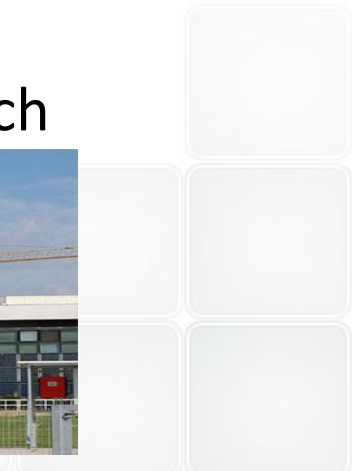
# ENEA's R&D activities

<http://old.enea.it/com/ingl/default.htm>



- Energy Efficiency
- Renewable Energy Sources:
  - Concentrated Solar Power, Biomass and Biofuels, Solar Thermal, Hydrogen and Fuel Cells, Energy Storage Systems
- Nuclear Energy
  - Fission and Fusion
- Environment and Climate Change:
  - environmental technologies, modelling, prevention, conservation and reclamation activities

- Health and Safety:
  - Seismic protection, biological effects of ionising radiations, radioprotection, metrology of ionising radiations
- New Technologies:
  - material sciences, applications of ionising radiations, Agro-industrial innovation & technologies, ICT
- Power System Research

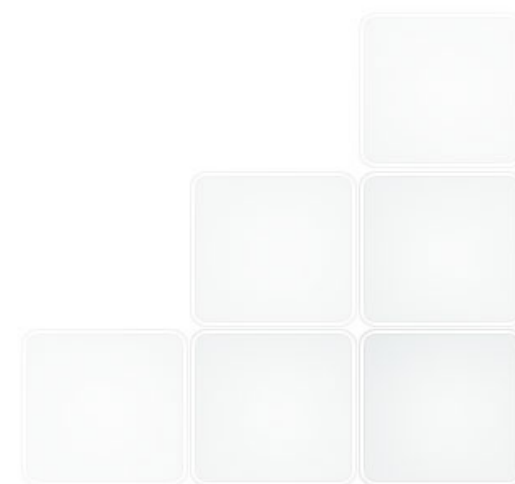




# Structure of the presentation



1. ENEA in brief
2. Description of a new GHG emission fiscality:  
Carbon Added Tax (CAT) - analogies with VAT
3. Pros and cons of the mechanism
4. Possible next steps



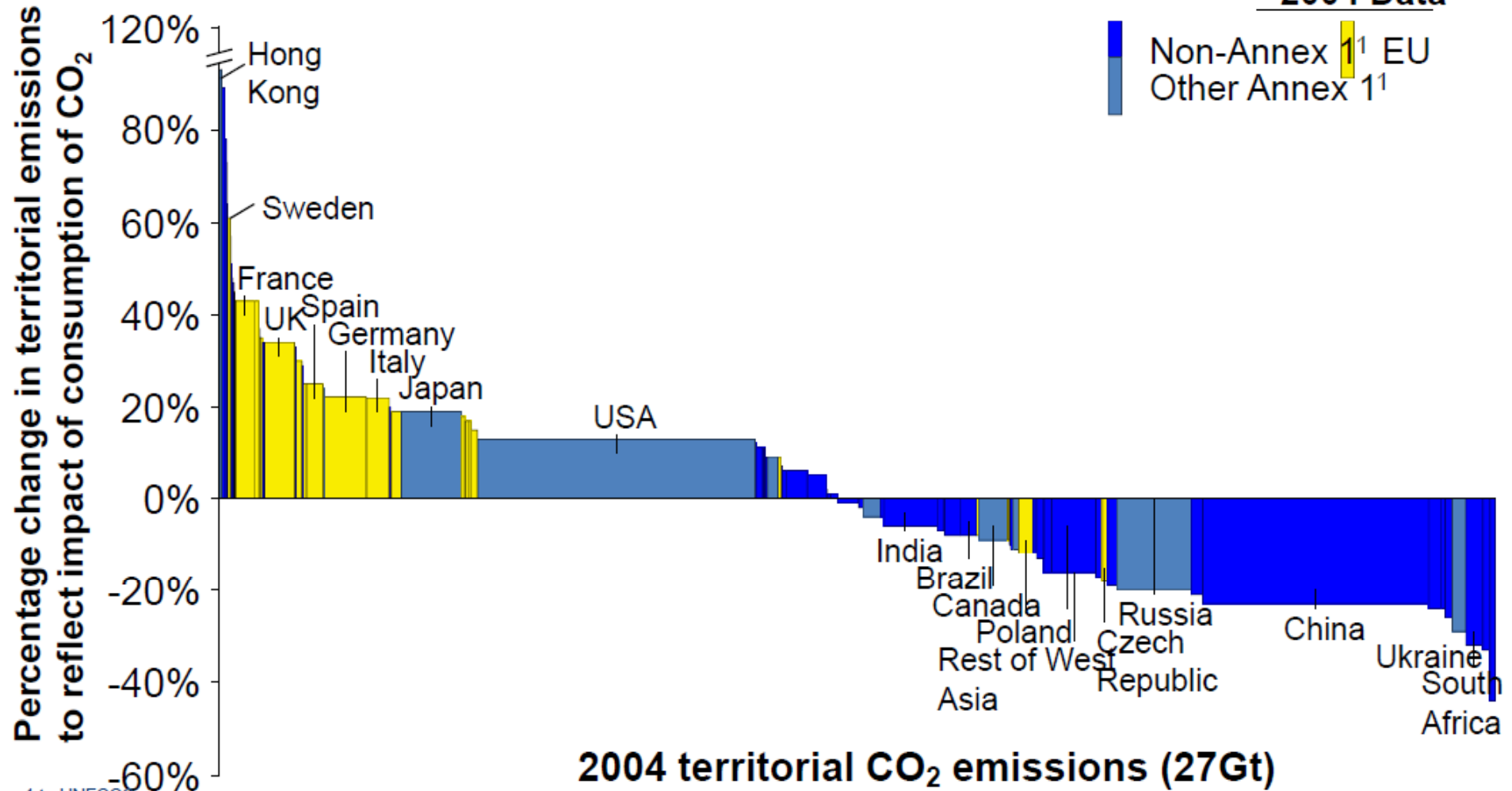
- Global GHG emissions rise despite the widespread implementation of several P&Ms;
- Current recession calls for a response: push for more innovation, carbon free technologies in the industrial sectors and find ways to stimulate international investments;
- International trade dynamics change GHG emissions patterns.



# There is a large and growing wedge between production and consumption of emissions



2004 Data



1. Annex 1 to UNFCCC

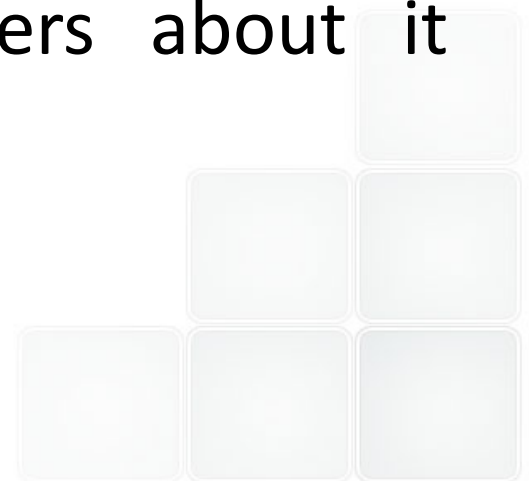
Note 1: Includes CO<sub>2</sub> emissions from production, process, transport and household sources only (27Gt in 2004); excludes non-CO<sub>2</sub> emissions, and emissions due to land-use-change

Note 2: Based on an MRIO (multi region input/output) model allocating emissions to regions of consumption

Source: Carbon Trust, *Global Carbon Flows, 2011* (Data: CICERO / SEI / CMU GTAP7 MRIO Model (2004))

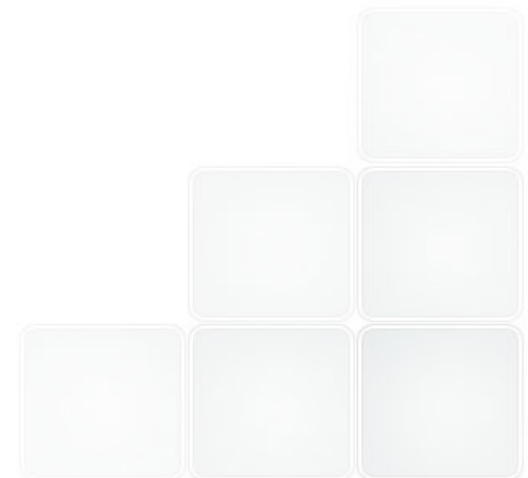
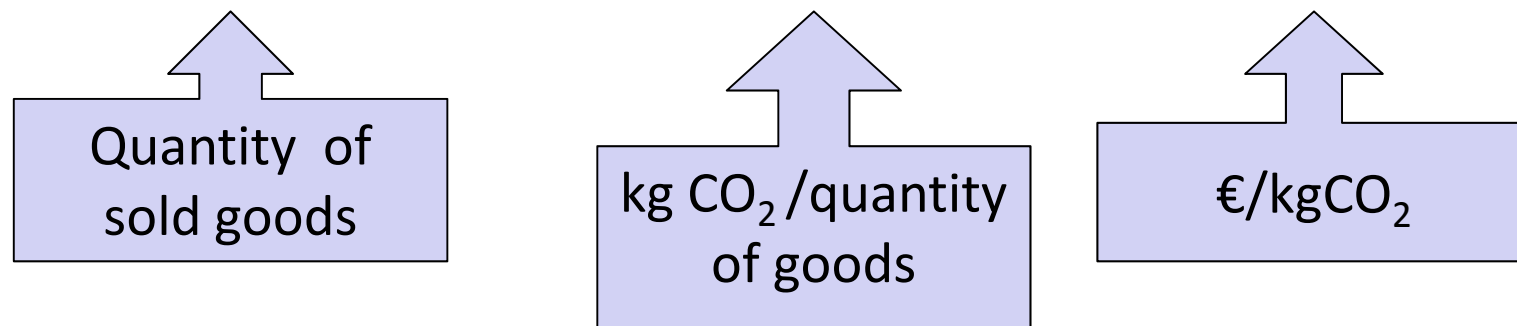


- The proposed GHG taxation mechanism consists of a duty for each producer to account  $\text{CO}_{2\text{eq}}$  (carbon dioxide or other climate change gasses) related to productive process of goods or services.
- On each receipt or invoice of the goods the  $\text{CO}_{2\text{eq}}$  emission related has to be clearly indicated.
- This carbon accountancy can identify the specific carbon emission of each product in a simple and reliable way and inform the customers about it through the receipt.

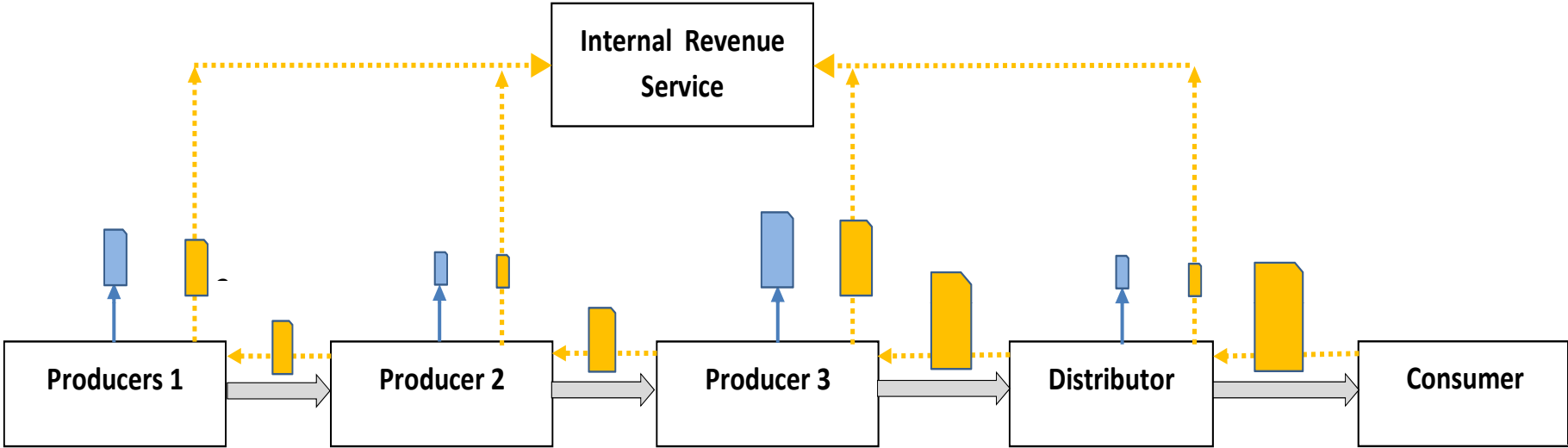


*CAT - Carbon Added Tax* is composed of three factors:

$$CAT = Goods\_quant * Emiss\_factor * Tax\_Rate$$



# Scheme of taxation mechanism



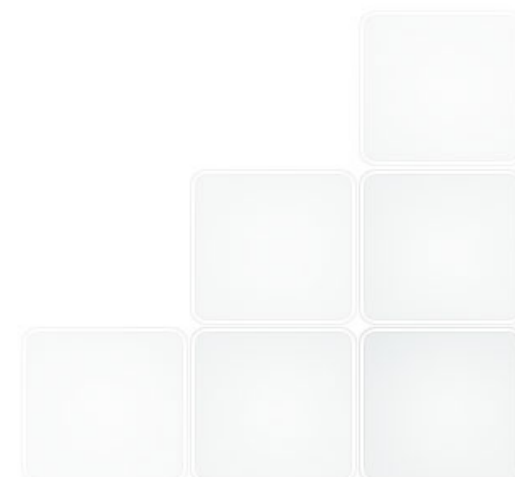
- CO<sub>2</sub> Emissions during productive process*
- Consumer goods flux*
- Carbon added tax (CAT)*



# Structure of the presentation



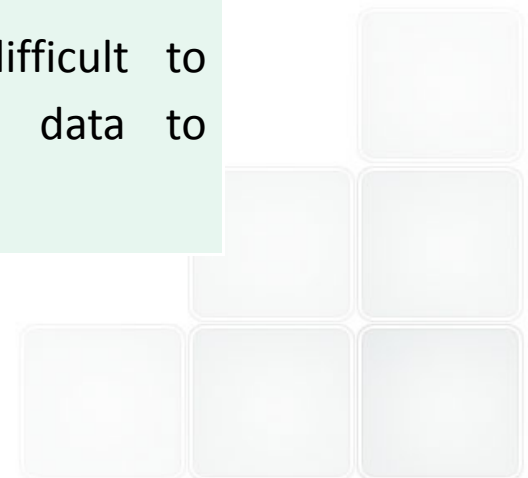
1. ENEA in brief
2. Description of a new GHG emission fiscalilty:  
Carbon Added Tax (CAT) - analogies with VAT
3. **Pros and cons of the mechanism**
4. Possible next steps



# PROs and CONs Discussion

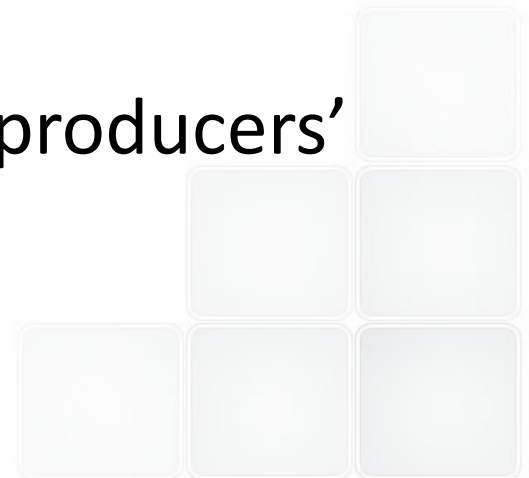


PROs	CONs
The mechanism could be scalable in both the products involved and in the amount of tax applied and adjust to the level of ambition required	The mechanism of accountancy could be cumbersome in some cases.
An Adjustment at the border is feasible	Inelastic behavior of buyer
It will provide a precise signal in price	Inelastic behavior of the producer
Additional funds to climate change mitigation and adaptation projects	At border it could be difficult to provide/obtaining emission data to apply the tax.





- From this preliminary analysis the CAT novel method seems to offer a set of advantages:
  - Simple, transparent, shareable, applicable in different settings
- Possible gradual application in different contexts (such as: European, multilateral, global level) in order to adjust it *in itinere*
- Further studies requires:
  - Quantitative analysis;
  - Market studies on consumers' and producers' behavior



Thanks for the attention

[sergio.lamotta@enea.it](mailto:sergio.lamotta@enea.it)

