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The "non paid ecological costs" approach in France

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Introduction

Context:

A lot of works and initiatives on the "beyond GDP" issue:

- ✓ Rio +20 (WG GDP+), Stiglitz commission report, UNECE/OECD/Eurostat TF, EEA and OECD works, ò
- ✓ In France: a new national strategy for 2014-2020 is in the course of elaboration.

Objectives:

- Elaborating new indicators to complement GDP;
- Improving the description of the relations between nature and the economy;
- Contributing to environmental policies (ecological transition).



Two different visions of the relations between nature and the economy (degradation issue)

1° SEEA EEA (volume 2) vision

- Nature is represented as a supplementary sector beside economic sectors and households.
- Its degradation is analysed through the functioning and the capacities of ecosystems.
- The valuation of ecosystems services and ecosystems degradation may give rise to an adjusted NDP aggregate. The adjustments are positive for the the non market ecosystems services while they are negative for the degradation of ecosystems.

2° Non paid ecological costs (NPEC) approach

- Nature and economy = 2 separated entities.
- No valuation of ecosystemic services.
- The degradation of natural assets coming from human activities is considered on the final demand side.
- Two main reasons:
 - The final demand includes the emissions resulting from production processes as well as those generated by final uses (residential heating, households transports).
 - The domestic final demand includes imports of products which causes residuals abroad.

Final demand at total costs

The concept has been elaborated by André Vanoli (former national accounting director at Insee). A similar notion has been implemented by Jean-Louis Weber at the EEA: "consumption at full price".

The purpose is not to raise the level of consumption by adding a new line to the list of consumed products. The volume of consumption and its content do not differ from the national accounts.

The approach consists in a valorisation mode of the domestic final demand to take into account the NPEC.

⇒ The value of the consumed products may be adjusted by the costs of avoiding a supplementary degradation (but actually not borne at a sufficient level).

$FDTC = FDPC + NPEC$

Final demand at total costs = Final demand at paid costs + non paid ecological costs

NB:FDPC is a SNA aggregate (Final consumption + gross capital formation).

Consequences:

- The value of final demand is modified while the economic production value (GDP or NDP) and the national income are left unchanged;
- The national saving (gross or net) is reduced by the annual amount of NPEC;
- The accounts are balanced by a capital transfer from nature to the economy.



The NPEC approach differs from the "greened economy modelling". It is not proceeded to an internalisation of the non paid costs to establish their potential consequences on the whole economy (new estimates of production, income, consumption, prices, foreign trade, etc.).

Non paid ecological costs (NPEC): definition

Notion close to the "maintenance costs" concept.

Concept radically different from the "costs of environmental damages"

NPEC : Costs of measures for preventing or restoring environmental deterioration but actually not borne by the economy at a sufficient level. 5 types are mentioned in the SEEA 1993:

- Reduction in economic activities or complete abstention from specific activities;
- Substitutions among the outcomes of economic activities (production of other products or modification of household patterns);
- Substitutions among the inputs of economic activities without modifying the outputs (use of new technologies);
- Activities to prevent environmental deterioration, without modifying the activities themselves (end of pipe technologies);
- Restoration of the environment and measures diminishing the environmental impacts of economic activities.

The related costs have to be estimated. They answer the question: what would have been the cost amount to avoid the observed annual degradation?



NPEC: practical precisions

Point of departure: observation of a physical degradation of natural assets. There are 2 sides of the same coin:

- When the observation is related to an additional degradation year in year out \Rightarrow formation of NPEC (annual); Issue to be treated in the flows account.
- When the observation consists in revealing the gap between the present state of natural assets and the value of given ecological norms \Rightarrow Ecological debt (ED); Issue to be treated in the balance sheet.

Costs evaluation:

- ❑ Evaluations may be realized by different public organisms: departments of Ministry in charge of Sustainable Development, research organisms, multipartners committees (often working after a ministerial order), spacialized public bodies (water agencies).
- ❑ When several evaluations for the same objective are available (e.g. one in terms of products substitution, another in terms of new investments), the less expensive one should be retained.
- ❑ The available costs evaluations for different environmental domains more often than not consist in the sum of the costs to reach an ecological norm. \Rightarrow More materials on the ED than on NPEC side.



Ecological debt

ED : NPEC accumulation which occurred since the date the ecological thresholds have been exceeded.

$$DE_n = \sum_{i=d}^n CENP_i$$

d = first year during which ecological threshold was exceeded

At the present time ED can be estimated by the total cost amount to get back to the value of relevant ecological norms.

Practically (if borne by the economy), the estimated amount of costs needs to be applied during several years, or even decades.

When efforts are made resulting in annual emissions decrease the NPEC are nil and the ED is reduced. In this case, the NPEC which appeared the former years are changing into paid costs (+ capital transfer economy \Rightarrow nature).

These new paid costs are borne by economic agents or activities: they influence the economic flows and contribute to the formation of prices, the GDP, etc. 

In practice, when emissions are decreasing, it is difficult to rely the phenomenon to a certain amount of new paid costs (investments, transfers, \tilde{o}).

For instance, a decrease of air emissions can be due to some extent to a change in the meteorological conditions. Neither NPEC nor new paid costs in this case.

Application: estimation of NPEC linked to non avoided GHGs

This case comes under a global issue (vs local)

SEEA asset: "Atmospheric systems" \Rightarrow global public good.

To preserve its functions global GHGs emissions need to be reduced by half between 1990 and 2050.

In France the objective is a division by four of the emissions level (in accordance with European Union vision).

A precise path has to be defined: which emissions quantity has to be avoided year by year?

The unit abatement cost (marginal cost) has to be known.

Once a new observation on GHGs emissions is available:

- Is the emissions quantity higher than expected (according to the adopted path)?
- If so, the difference has to be valued by the unit abatement cost.

Application: estimation of NPEC linked to non avoided GHGs (2)

Assumptions and materials to provide an estimation (on the basis of an example)

- 1) Defining a path for annual CO₂ emissions towards the target: e.g. . 3,5% per year from 2012 to 2050
- 2) Result of 2012 CO₂ emissions in France (estimation): increase by 1,1%.
- 3) The difference between the expected level and the actual level = non avoided emissions (additional degradation). The quantity is: 12 MtCO₂.
- 4) This amount has to be valued by the unit cost of carbon (cost to avoid one supplementary ton of CO₂ emitted).
⇒ Use of the marginal cost of carbon proposed by French report "2020 . 2050 Trajectories towards an carbon efficient economy" (De Perthuis Committee, 2011):
From 35 " /t in 2012 to 300 " /t in 2050 (for scenario T30).
- 5) In this framework, the non paid ecological costs are estimated to 425 M" in 2012.

Ongoing project

- ❖ Dashboard on NPEC: valuation of the amounts of NPEC for different natural assets. 
- ❖ Estimating indicators of the imbalance of the relations between nature and the economy (once having a sufficiently complete view of the global NPEC (atmosphere, water, soils):
 - “ *Final demand at paid costs / Final demand at total cost (%)*
 - “ *Degradation adjusted net saving: $NS - NPEC$ (”); $(NS - NPEC) / NS$ (%)*
 - “ *Ecological debt variation (” & %).*

Great interest in experiences led by other countries in the field of avoidance or restoration costs.

Dashboard on non paid ecological costs (extract)

Natural asset	Natural environment / Type of pollution	Ecological threshold / norms	State and physical change of natural assets	Valuation mode of non paid costs	Estimated amount of annual NPEC ecological debt	Estimation quality / remaining issues
Climate	Greenhouse gases: 6 direct GHGs Kyoto protocol	France: four-fold reduction in emissions between 1990 and 2050 (POPE act 2005) ⇒ factor 4	France: emissions are decreasing, but at an insufficient rythm: - 1 % while – 3 % is required.	Marginal abatement cost of carbon: 35 €/t in 2012 ("de Perthuis" committee", scenario T30)	ED (€bn): [260;440] Source: de Perthuis committee report NPEC: 0,4 €bn in 2012 Source: SOeS estimation based on de Perthuis committee	 Estimations should be confronted with other approaches.
Inland water	Surface water, ground water	EU directive on water policy (2000): good quantitative, ecological and chemical status to be achieved in 2015.	Good ecological status achieved by 41 % of the bodies of surface water (2009); Good chemical state for 43 % of the bodies of SW; Bad chemical status for 41 % of the groundwater bodies.	Measures programs established by the French water agencies.	ED: €51 bn Source: French water agencies Sum of the costs of measures programs established by the different water agencies. NPEC: no estimation	 Difficult to know wheter this amount only contains additional costs. Possibility to estimate NPEC through the use of interim evaluations.

Simplified representation

Nature accounts (annual variation)	
Natural assets degradation:	- 50
Capital transfer:	50

Accounts of the economy	
Gross domestic product (GDP):	1000
Gross operating surplus:	300
Gross disposable income:	1000
	-
Final consumption:	900
$NPEC_{FC}$	45
	=
Adjusted gross saving 1:	55
	-
Gross capital formation:	100
$CENP_{GCF}$	5
	=
Adjusted gross saving 2:	-50
	+
Capital transfer:	
$CENP_{CF} + CENP_{FBC}$	50



Thank you for your attention



Annex: GHGs emissions projection in France

