BENCHMARKING AS ALLOCATION METHOD

The experience from Italian NAPI and NAPII

CEPS

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Italian Ministry for Environment, Land and Sea

Scheme of presentation

- *[Skipping intro: issues already addressed]* *
- Overview of BM approach in Italian NAP1 and 2
- Selection of practical experiences of application of BM in Italy
- Lessons learnt from practical application of BMs
- Conclusions

**See also:* http://ec.europa.eu/environment/climat/emission/pdf/harmonisation/5a.pdf

BM approach in Italian NAP I and NAP2

Benchmark approach as allocation method was applied in Italy in Phase I and II

	Phase I	Phase II
Incumbents	Power sector	Power sector
	Cement sector	Cement sector (indirect)
	Lime sector	Lime sector (indirect)
New entrants	All sectors	All sectors

Focus on some methodologies and preliminary results

Incumbents in Phase I: ex.cement sector

"$Q_{t,j,n} = Q_{t,j} * L_{n,j} / \Sigma_{(i=0..., m)} L_{i,j}$

Allocation formula in NAP 1

Dove:

$Q_{t,j,n}$ = Quote assegnate all'impianto n appartenente all'attività di riferimento j per l'anno t
$Q_{t,j}$ = Quote assegnate all'attività di riferimento j nell'anno t per gli impianti esistenti
$X_{n,j}$ = Quota parte relativa all'impianto n nel settore d'attività di riferimento j a cui esso appartiene"

... "translating" into the general formula..

$$A = BM_e \cdot C \cdot CF \cdot AF$$

with

A	$Allocation [EUA]$
BM_e	$Emission\ Benchmark [t\ CO2 / t\ product)$
C	$Capacity\ of\ the\ installation [t\ product]$
CF	$Capacity\ use\ factor\ for\ the\ installation (standardized\ or\ historic) [\%]$
AF	$Adjustment\ factor\ for\ the\ installation\ (auctioning\ share, sector\ caps, sector\ growth, etc) [\%]$

BM value: $Q_{t,j}/\Sigma_{(i=0...m)}L_{i,j}$

Where:

$Q_{t,j}$: *cement sector cap **[EUAs]***

$\Sigma_{(i=0...m)}L_{i,j}$: *sum of the average historical clinker production **[t clinker]***

Incumbents in Phase I: ex.cement sector

BM value: 0,8197
EUA/t clinker

Activity data: based on historical clinker production

- No projections for production
- No correction factor for moisture content
- No correction factor for fuel mix, age or size of the plant
- No correction factor for waste use
- No individual BM

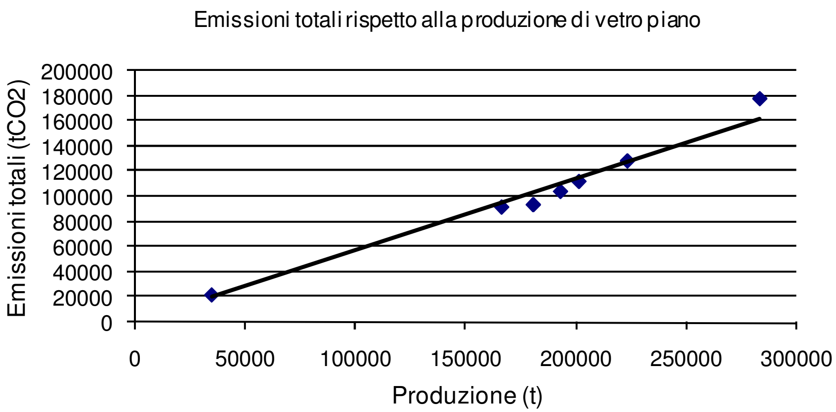
Acceptability issue

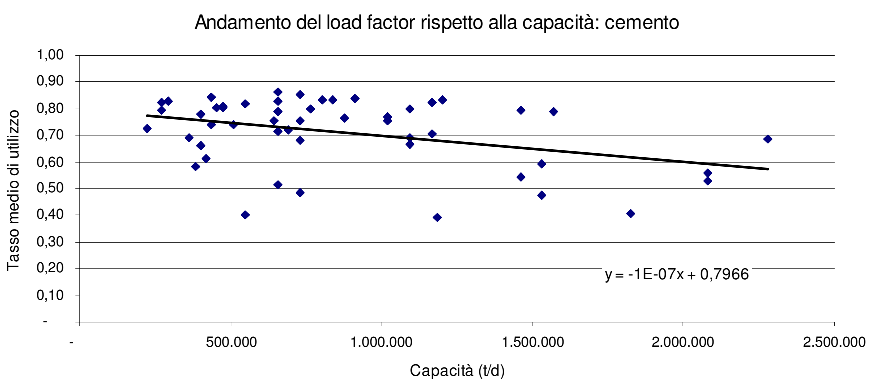
Clinker Vs. Cement

The majority of operators for clinker even if some of them did request a cement based benchmark

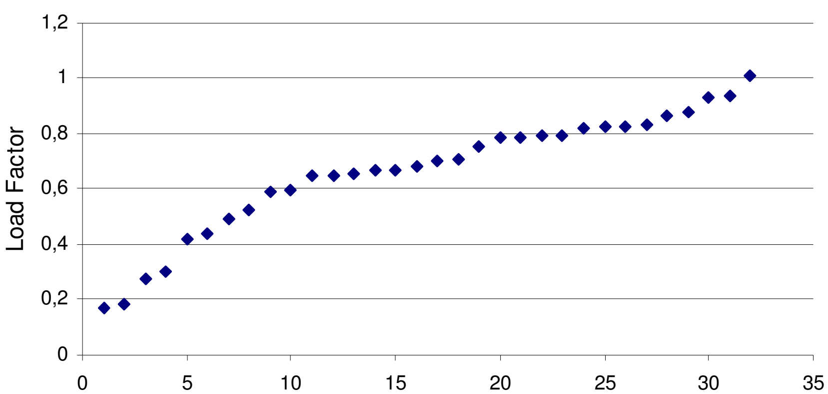
In phase II the same approach was adopted but a growth factor based on increase/decrease of production could slightly vary the allocation of ± 3%

New entrants: the general rules





- No consideration for any increase of capacity utilization
- Only <u>direct</u> emissions considered
- No individual correction factors
- Top percentile approach
- <u>Data collected from operators</u>



New entrants in phase I: ex. cement sector

- $Em_{sp\ proc}$: specific calcination emissions = 0,54 [tCO_2/tclinker]
- $Em_{sp\ comb}$: specific combustion emissions = 0,30 [tCO_2/tclinker]

Combustion specific emissions: Combining combustible historical mix and specific energy consumption derived from BAT (Dry kiln with preheater and precalciner)

No correction factor for moisture, fuel mix, age of the plants, waste use..

Key aspect → Activity data: Kiln production capacity [tclinker/day]

- Kiln capacity can vary ± 10%
- Kiln/plant production capacity a key point: performance test used to prove design capacity , maybe verification needed
- Real increases of capacity to be rewarded and not removing of bottlenecks: only new system kilns eligible for allocation

From NAPI to NAPII: experience in power sector

•NAP I

• Fuel differentiation

• Technology differentiation

•Activity data represented by power [MWe] and not historical production because of significant changes in the market structure (liberalization of the energy market)

•NAP II

• Fuel differentiation

• No technology differentiation

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•Activity data represented by 2005 verified production data considered representative of the expected production (when coupled with a standard decreasing trend for some fuels/technologies)

Less differentiation More simplicity Less distorsions in allocation

BM index – incumbents in NAP II

Specific emissions of the installation

$$IB = w \times \frac{EmSp_{k,\ impianto} - EmSp_{k,\ settore}}{EmSp_{k,\ riferimento} - EmSp_{k,\ settore}}$$

Reference specific emissions (90th and 10th percentile)

Average sector specific emissions

- 3% < IB < +3%
To smooth distorsions linked to historical emissions

In order to avoid distortions: in sectors in which cogeneration on site is a common practice (i.e. paper sector) the specific emission factor takes into account also indirect emissions caused by electricity production off-site

Lessons learnt (1/4)

Data accessibility and consistency

- Clear rules for collecting data are needed, because:
  - Existing literature statistics and data not always useful, especially for specific emissions and load factors
  - The lack of transparency could undermine the system and raise litigations which could be hard to solve
  - Series of data for the BM value must be consistent and reliable: process boundaries and related issues (scope of ETS, process outsourcing)

Lessons learnt (2/4)

Activity data

- Historical production as the best proxy of expected trends. No projections
- In exceptional cases a model could be used (e.g. Power sector NAP1) where an entire sector is exposed to deep market restructuring

Applicable only to liberalization of energy markets?!

- For new entrants, capacity x standard load factor

The relevant capacity can lead to disputes in some sectors and must be clearly and homogenously defined (tested and verified?!)

Lessons learnt (3/4)

Setting the BM value

- Avoid unnecessary differentiation (products if necessary, <u>no</u> technology)
- A top percentile approach (or best performer) is applicable to all sectors, including those with complex processes
- Issues concerning heat-flows only partially solved by allocating to direct emissions (deep knowledge of the single devices installed in the plant)

Lessons learnt (4/4)

Fall back approach: BM index for incumbents

- BM index can be used to adjust allocation calculated on historical emissions
  - *Interesting as a fall-back approach where a proper BM is not feasible, since it's possible to freely decide the "weight" of the index*
  - *But it's only a second best*

Open issue: if a fall back approach is applied, comparability (in reduction effort) between BM method and fall back approach shall be assured

Conclusions

- Benchmarking as allocation method is complex but feasible. Technical solutions can be found to solve open issues but it is crucial to have reliable data bases
- Transparency is a key issue for the functioning of the whole system
- Only if a BM approach is not applicable, a fall back approach could be the solution (with BM index or other)

Thank you

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