The European Commission's science and knowledge service

Joint Research Centre

EU Ecolabel revision for hard coverings criteria

2nd Ad-Hoc Working Group meeting
Brussels, 3-4 October, 2019

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European Commission

Content: Day 1

Day 1: Thursday 3rd October 2019

		SCHEDULE
1.	Welcome and introduction to work programme and timeline	14:30 – 15:00
2.	Product groups scope and definitions	15:00 – 15:30
3.	Structure of the Criteria. Preamble to the Annex- Assessment and verification	15:30 – 15:50
	Coffee break	15:50 – 16:05
4.	Discussion about scoring approach	16:05 – 16:20
5.	Horizontal criteria 1.1 to 1.3	16:20 – 16:50
6.	Horizontal criteria 1.4 to 1.7	16:50 – 17:20

Agglomerated stone criteria

Contents: Day 1

1. Timeline
2. The bigger picture of EU Ecolabel Hard Coverings
3. Scope and definition
4. Overall criteria structure (Preamble)
5. Types of criteria
6. Why a scoring approach
7. Horizontal criteria 1.1 to 1.7
8. Agglomerated stone criteria...

1. Hard Coverings timeline

- **Sept 4, 2019:** Publish TR 2.0.
- **Oct 3-4, 2019:** 2nd AHWG meeting in Brussels.
- **Nov 4 (not 1), 2019:** Deadline for feedback to 2nd TR and proposals.
- **Jan-Feb 2020:** TR 3.0 ready ahead of EUEB.
- **Feb-Mar 2020:** EUEB meeting and final feedback.
- **Feb-May or Mar-Jun 2020:** ISC.
- **Jun 2020:** EUEB and Reg. Com. vote.

2. The bigger picture

- EUEL is produced for the same marketing reasons as for other PGs (supply side signal).
- Simple link to Green Public Procurement planned – hugely relevant demand side signal - use of key criteria in User Manual guides
- Link to Green Building Assessment schemes (ongoing high level discussions) – another important demand side signal.

3. Scope

2019 Proposal:

- Floor, wall and roof coverings;
- By material
  - **Natural stone**
  - **Agglom. stone?**
  - **Pre-cast concrete**
  - **Ceramic**
  - **Fired clay**
- By product type
  - **Masonry unit**
  - **Brick**
  - **Block**
  - **Paver**
  - **Tile/slab**
  - **Table-top**
  - **Countertop**

2009 Decision:

- Floor and wall coverings;
  - **Natural stones**
  - **Agglomerated stones**
  - **Concrete paving units**
  - **Terrazzo tiles**
  - **Ceramic tiles**
  - **Clay tiles and pavers**

3. Scope – agglomerated stone

- Already covered by Decision 2009/607/EC
- No licenses to date
- No data received from industry during consultation periods
- Normal practice → discontinue
- But data received at last minute and industry now expressing interest in EU Ecolabel...opinions?
  - **-ve draft criteria from TR v1.0, would need to be re-consulted quickly in light of production data.**
  - **+ve An important market (esp. in countertops).**

3. Definitions

- Natural stone products.
- Agglomerated stone products?
- Fired clay and ceramic products.
- Pre-cast concrete products.

- Some terms are not defined clearly in relevant standards.
- Consultation with relevant CEN/TCs* on this issue necessary.

*CEN/TCs: 67; 125; 128; 178; JWG 229/246; 229; 246

3. Definitions

- **9 types of product** (floor tile, wall tile, roofing tile, masonry unit, brick, block, paver, table-top and kitchen countertop).
- **3 (or 4) types of material** (natural stone, agglomerated stone, fired clay/ceramic and pre-cast concrete)
- So do we make 9 + 3 (or 4) definitions? **i.e. 12 or 13**.
- Or 9 x 3 (or 4) definitions? **i.e. 27 or 36**
  - Lower number would be JRC preferred option
- Any need to distinguish between "ceramic" and "fired clay"?

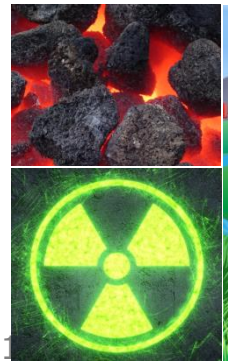
4. Overall criteria structure

Horizontal criteria common to all hard covering products
4x PG specific horizontal criteria (EMS, mineral extraction, haz. subs., VOCs) (10pts)
3x standard horizontal criteria (Fitness for use, consumer info, info on label)

Product specific criteria		
2. Natural stone products	**4. Ceramic and fired clay products**	**5. Concrete products**
4x quarry specific criteria (60pts)	**7x** ceramic factory specific criteria (90 or 100 pts)	**3x** cement specific criteria (65 pts)
4x transformation plant specific criteria (50pts)		**3x** concrete specific criteria (55pts)

5. Types of criteria

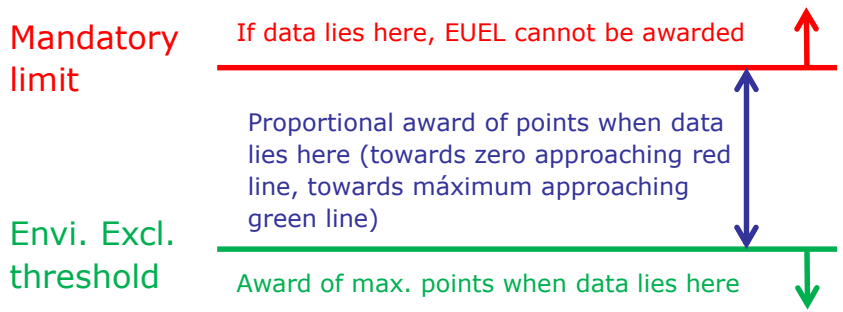
- Common criteria areas for different materials:
  - **Process waste/recycled/2ndry materials**
  - **Water/wasterwater**
  - **Energy-Emissions to air**
- Approach is nuanced for how each sector works



5. Types of criteria

Combined requirements:

- Mandatory limit, but with points for being above minimum or below maximum limits.
- Points proportional to where data lies in between mandatory requirement and threshold of environmental excellence, e.g. CO2 emissions for cement:



Mandatory requirements:

- Purely pass-fail, for example hazardous substance restrictions.

Optional requirements:

- Purely optional, a way of gaining extra points, for example environmentally innovative concrete products, or being EMS certified.

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6. Why a scoring approach?

- Steerability for interested producers
- Too many pass-fail criteria → unintended consequences
- Scoring provides a more flexibile approach
- Quantitative approach fits nicely with GBA scheme philosophy
- Could fit nicely with GPP award criteria
- But care needed not to overload points on supply side (steerability down)
- Should all scores be normalised to 100? What should pass mark be?
- Either fix ambition level via limits in criteria.
- Or fix ambition level via number of points needed.
- Current proposals try to ask applicants to be in top 50% of market for all criteria where points can be scored.

Criterion 1.1. Environmental Man. System

- ISO 14001 = 3 points
- EMAS = 5 points
- A **purely optional** requirement now
- Systems must cover the facilty/facilities where EU Ecolabel product is produced
- Wide uptake in ceramic and cement sectors
- Unsure about concrete sector
- Unsure about uptake in natural stone sector
- So potential improvement in concrete and natural stone sectors

Criterion 1.2. Mineral extraction

- 2009 requirements that were dropped in TR v1.0, now reinserted
- Authorisation and map required again
- Rehabilitation plan and/or EIA
- Invasive species requirement (new)
- Habitats and Birds Directives compliance
- Natura 2000 and non-EU equivalent extraction conditions stated
- How to verify non-EU sourced raw materials for equivalent to Birds and Habitats Directive?

Criterion 1.3. Hazardous substance restrictions

Two main changes

- TiO2 derogation for photocatalytically active surfaces removed
- But TiO2 derogation for impurities in raw materials remains.
- Ti is the 9th most abundant element in earth´s crust
  - **0.4% to 0.6% as Ti (on average)**
  - **Around 1.0% as TiO2 (on average)**
- Allowance for 2.0% as impurity provisionally inserted.
- Crystalline silica derogation
  - **Serious health concern in agglom. stone & natural stone sectors.**
  - **May be used as minor addition in other products**

Criterion 1.4. VOC emissions

Mandatory elements

- Communication requirement.
- Formaldehyde resins banned.

Optional elements

- 5 points if no VOC containing treatments used
- 5 points if VOC containing treatments used but VOC emissions for final product are within defined limits.

Now simpler than TR v1.0.

If agglomerated stone included, separate styrene limit may be needed (450 instead of 250 → Greenguard VOC standard).

Criterion 1.5. Fitness for use

Mandatory element

- Compliance with relevant standards required.
- Standards referred to cover a range of different performance classes.
- Too complicated to state every technical requirement for each class.
- Most important thing is that performance class is stated when relevant so that consumer can use product appropriately.
  - **E.g. For local climate conditions (e.g. freeze-thaw resistant)**
  - **E.g. For traffic load on paving (e.g. tensile strength)**

Any standards missing?

To be consulted with CEN/TCs.

Criterion 1.6. Consumer information

Mandatory element

- No change from TR v1.0.
- Most important point is that consumer (individual or construction company) has the required information to install and maintain the product correctly.
- Information about EoL options is of interest from a circular economy perspective → informing public.

Criterion 1.7. Information on EU Ecolabel

Mandatory element

- Still very much open for discussion
- Due to optional elements and high scores in certain criteria, possible messages could be conditional.
  - **E.g. Low CO2 ceramics, how low does CO2 emission need to be for the message to be allowed? Maybe there can be a low-CO2 and a very low-CO2 and even an ultra low CO2 message…?**
- Likewise for material efficient products and so on.

Discussion on criteria 1.1 to 1.7?

- 1.1 Environmental Management System
- 1.2 Mineral extraction
- 1.3 Hazardous substance restrictions
- 1.4 VOC emissions
- 1.5 Fitness for use
- 1.6 Consumer information
- 1.7 Information on EU Ecolabel

Agglomerated stone criteria

Main reference is to TR v1.0

Maintained in TR v2.0 (strikethrough), no changes had been made since TR v1.0.

4 specific criteria:

1. Energy consumption during process.
2. Emissions to air.
3. Recycled/secondary material content.
4. Binder content.

Agglomerated stone criteria

1. Energy consumption

- Basically electricity only (so could express limits as kWh or MJ).
- In 2009, limit of 1.6 MJ/kg
- In TR v1.0, limit of 1.1 MJ/kg
- Could offer points for going to lower MJ/kg
- Could offer points for going to higher % of renewable electricity

2. Emissions to air

- In 2009, limits for styrene, dust, NOx and SOx
- Only limits for styrene and dust seem appropriate (no fuel combustion)

Agglomerated stone criteria

3. Recycled/secondary material content

- No criterion for this in 2009
- Batch production process seems well suited for A+V
- Could maybe align (partially or fully) with criterion 5.4 for pre-cqst concrete?

4. Binder content

- Generally ranges from 5 to 15% (depends on particle size)
- 10% limit set in 2009 (embodied energy and VOCs)
- Could reward lower than 10% binder content
- Could reward bio-based content in binder

Discussion on agglomerated stone criteria

- 3.1 Specific energy consumption
- 3.2 Emissions to air
- 3.3 Recycled/secondary material content
- 3.4 Binder content / type
- Other aspects….?

Thanks

Any questions?

Email: JRC-B5-HARDCOVERINGS@ec.europa.eu

Keep up to date with the project:

JRC website: http://susproc.jrc.ec.europa.eu/Hard_coverings/index.html (for everyone)
BATIS: http://eippcb.jrc.ec.europa.eu/batis/ (for registered stakeholders only)

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Content: Day 2

		SCHEDULE
1.	Ceramic criterion: 4.1. Specific fuel energy consumption	9:30 – 10:00
2.	Ceramic criterion: 4.2. Specific CO2 emissions	10:00 – 10:30
3.	Ceramic criterion 4.3: Process water	10:30 – 10:50
	Coffee break	10:50 – 11:05
4.	Ceramic criterion 4.4: Emissions of dust, HF, NOx and SOx	11:05 – 11:35
5.	Ceramic criteria 4.5, 4.6 and 4.7: Waste water management, process waste reuse and glazes	11:35 – 12:00
6.	Concrete criterion 5.1: Clinker factor	12:00 – 12:20
7.	Concrete criterion 5.2: CO2 emissions from the cement kiln	12:20 – 12:40
8.	Concrete criterion 5.3: Non-CO2 emissions from the cement kiln	12:40 – 13:10
	Lunch break	13:10 – 14:10
9.	Concrete criterion 5.4: Concrete recovery and responsible sourcing of raw materials	14:10 – 14:40
10.	Concrete criteria 5.5 and 5.6: concrete plant energy management and environmentally innovative concrete products	14:40 – 15:00
11.	Natural stone quarry criteria (2.1.1 to 2.1.4): quarry landscape ratio; material efficiency; water and waste water management; quarry dust control	15:00 – 16:00
	Coffee break	16:00 – 16:10
12.	Natural stone transformation plant criteria (2.2.1 to 2.2.4): energy consumption; water and waste water management; dust control; transformation waste reuse	16:10 – 17:10

Contents: Day 2

1. Ceramic criteria 4.1 to 4.3
2. Ceramic criteria 4.4 to 4.7
3. Pre-cast concrete criteria 5.1 to 5.3
4. Pre-cast concrete criteria 5.4 to 5.6
5. Natural stone quarry criteria 2.1.1 to 2.1.4
6. Natural stone transformation plant criteria 2.2.1 to 2.2.4
7. AOB

4. Ceramics – scoring overview

	Ceramic or fired clay hard covering products	
1.1. Environmental Management System	Up to 5 points	
1.4. VOC emissions	Up to 5 points	
4.1. Specific fuel consumption	Option 1 proposal: up to 25 points	Option 2 proposal: up to 25 points
4.2. Specific CO2 emissions	Option 1 proposal: up to 15 points	Option 2 proposal: up to 25 points
4.3. Process water	0 points	
4.4. Emissions of dust, HF, NOx and SOx	Up to 40 points	
4.5. Waste water management	0 points	
4.6. Process waste reuse	Up to 10 points	
4.7. Glazes	0 points	
~~2.2.4. Transformation waste reuse~~	~~n/a~~	
Total points available	**100**	**110**
Minimum points needed for EU Ecolabel	**50**	**55**

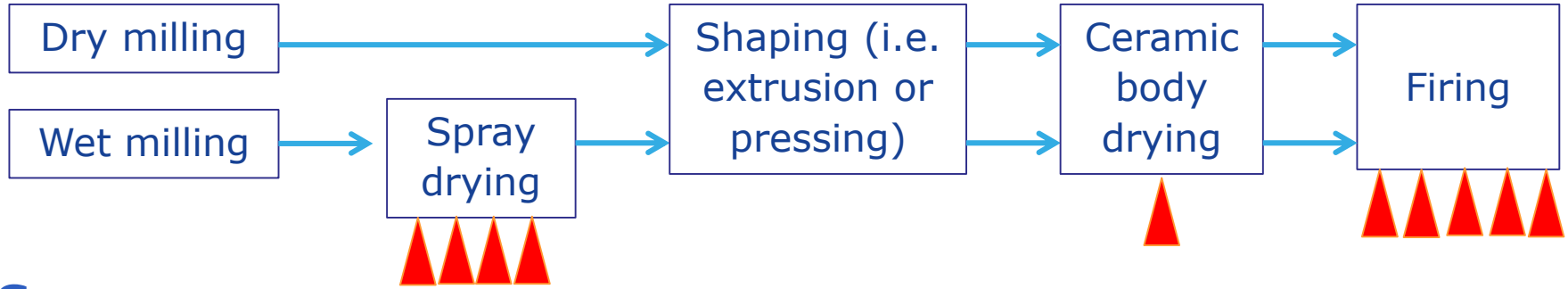
- 100% of points depend on final producer

4. Ceramics: key changes since TR v1.0

- More weight given to energy consumption
- Now points for CO2 emissions as well
- 2 options for the above criteria
  - **Kiln only approach (simpler but misses important impacts)**
  - **Kiln + drying (more complex but capture all main impacts)**
  - **To be discussed**
- Weight taken away from water / wastewater
- Energy and emissions to air are LCA hotspots

Ceramic criteria 4.1 Specific fuel consumption

Simplified ceramic/fired clay production process:



Scope:

2009 Decision:

TR2, option 1:

TR2, option 2:

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Criterion 4.1 – Specific fuel consumption

- **Option 1:** Firing kiln

Product type	Mandatory upper limit	Environmental excellence threshold	
ceramic tiles ≥6mm thick	3.5 MJ/kg	2.2 MJ/kg	from Decision 2009 & license data
ceramic tiles <6mm thick	75 MJ/m²	50 MJ/m²	from ISO 17889 & feedback
Fired clay brick, paving block and roof tile	3.0 MJ/kg	2.0 MJ/kg	from 2007 BREF
Fired clay masonry unit	1.9 MJ/kg	1.0 MJ/kg	from 2007 BREF

Up to 25 points shall be awarded in proportion to where the actual specific fuel consumption for firing kilns lies relative to the relevant values listed in the middle column and the right hand column

Ceramic criteria 4.1 Specific fuel consumption

Option 1:

- Starting point is 3.5 MJ/kg (from 2009 Decision)
  - **Keep as mandatory level for new criteria**
- Introduce environmental excellence threshold (i.e. maximum points) based on data analysis of existing license holders
  - **Top 25% = 2.2 MJ/kg (top 50% was 2.4 MJ/kg)**
- Other novelties: (i) separate limits for thin (<6mm tiles)*; (ii) limits for brick/block/roof tile**; (iii) limits for masonry units**.

*expressed as MJ/m2; **based on data ranges in 2007 BREF

Criterion 4.1 – Specific fuel consumption

- **Option 2:** Drying and fire kiln stages

Product type	Reference value
Spray-dried powder	1.8 MJ/kg powder*
ceramic tiles ≥6mm thick	4.0 MJ/kg
ceramic tiles <6mm thick	86 MJ/m^2
Fired clay brick, paving block and roof tile	3.5 MJ/kg
Fired clay masonry unit	2.2 MJ/kg

**includes any residual moisture content, which would typically be 5-7%*

Up to 25 points shall be awarded in proportion to how closely the score approximates 0.50

$$Fuel_{score}=0.35(SprayDryPowder)+0.65(KilnDryer)$$

Ceramic criteria 4.1 Specific fuel consumption

Option 2:

- Use option 1 numbers as starting point (for kiln part).
- Still need to add dryer part and, for tiles, spray dryer part.
- Separate value for spray drying because it can be carried out at separate site (1.8 MJ/kg ref. value chosen – BREF range was 1.1-2.2)
- Spray drying can be around 35% of total fuel consumption (Mezquita)
- Ceramic body drying typically around 10-15% of total fuel consumption (Mezquita, 2014; Carbon Trust, 2010)
- So a score, if equal to reference value, score = 1.00
- If less than reference value, score < 1.00 → EU Ecolabel points

Criterion 4.2 – Specific CO_2 emissions

- **Option 1:** from kiln fuel

Product type	Mandatory upper limit	Environmental excellence threshold
ceramic tiles ≥6mm thick	196 kgCO_2/t	123 kgCO2/t
ceramic tiles <6mm thick	4.2 kgCO2/m²	2.8 kgCO2/m²
Fired clay brick, paving block and roof tile	168 kgCO2/t	112 kgCO2/t
Fired clay masonry unit	107 kgCO2/t	56 kgCO2/t

Up to 15 points shall be awarded in proportion to where the actual specific fuel consumption for kiln firing lies relative to the relevant values listed in the middle column and the right hand column

Criterion 4.2 – Specific CO_2 emissions

- **Option 2:** from kiln fuel, dryer fuel and material decarbonisation

Product type	Reference value
Spray-dried powder	101 $kgCO_2/t$ powder*
ceramic tiles ≥6mm thick	274 $kgCO_2/t$ product
ceramic tiles <6mm thick	5.8 $kgCO_2/m^2$ product
Fired clay brick, paving block and roof tile	246 $kgCO_2/t$ product
Fired clay masonry unit	173 $kgCO_2/t$ product

**includes any residual moisture content, which would typically be 5-7%*

Up to 25 points shall be awarded in proportion to how closely the score approximates 0.50.

$$CO_{2score}=0.35(SprayDryPowder)+0.65(KilnDryer)$$

Ceramic criteria 4.2 Specific CO2 emissions

- Closely linked to criterion 4.1
- So 2 options also proposed.
- Specific CO2 emissions is a new proposal for TR v2.0.
- Huge LCA impact and process hot-spot: can we ignore it?
- Approach is simple:
  - **Multiple 4.1 values by carbon factor for natural gas**
  - **Add assumed process emissions from raw material carbonates**
- Mandatory limits/reference values apply in similar way as 4.1.
- Double counting? Yes but no.

Ceramic criteria 4.3 Process water

Product type	Including spray drying?*	Consumption limit
Thin format ceramic tiles (≤ 6mm thickness)	Yes	20.0 L/m²
	No	10.0 L/m²
All other ceramic tile and fired clay products	Yes	1.0 L/kg
	No	0.5 L/kg

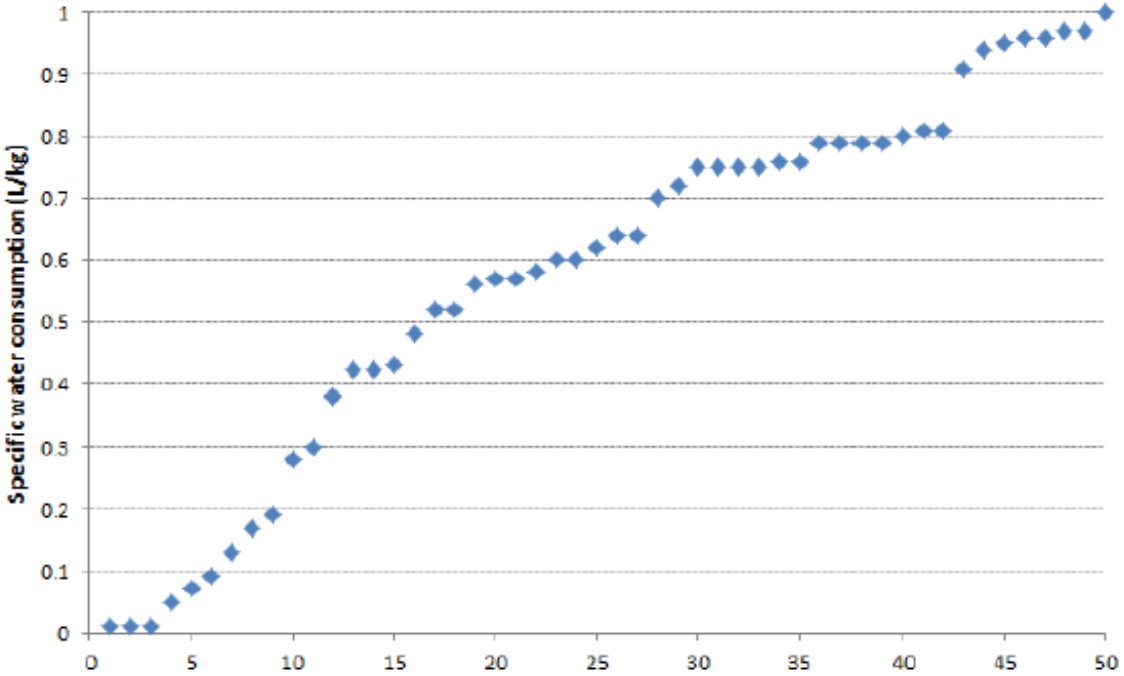
**Spray drying water consumption is only relevant to ceramic tile production and values should be included if the spray dryer is operated by the applicant or if the spray dried powder supplier provides this data.*

- Mandatory limits generally aligned with ISO 17889-1.
- 10 pts available in TR v1.0 for being 50% lower than mandatory limit.
- Now 0 pts, but mandatory requirement remains (points shifted to energy/CO2/emissions to air elements).
- No need to calculate consumption is closed loop wastewater system in place (i.e. all treated wastewater is returned to process).

Ceramic criteria 4.3 Process water

- Another reason for not requiring reporting if all treated wastewater is reused in the process:

- **(i) claimed that almost all ceramic tile industry has closed the wastewater discharge**
- **(ii) but get this data from licenses:**
- **Huge differences, all for ceramic tile**



Discussion on criteria 4.1 to 4.3?

- 4.1 Specific fuel consumption (option 1 and 2)
- 4.2 Specific CO2 emissions (option 1 and 2)
- 4.3 Process water

Ceramic criteria 4.4 Emissions of dust, HF, NOx and SOx

Main sources of data consulted

- 2007 BREF document (large gaps in clean gas data for several products within hard covering scope)
- Draft ISO 17889-1 for sustainable ceramic tiles (no limits set for SOx or NOx).
- Anonymised data provided from existing licenses.

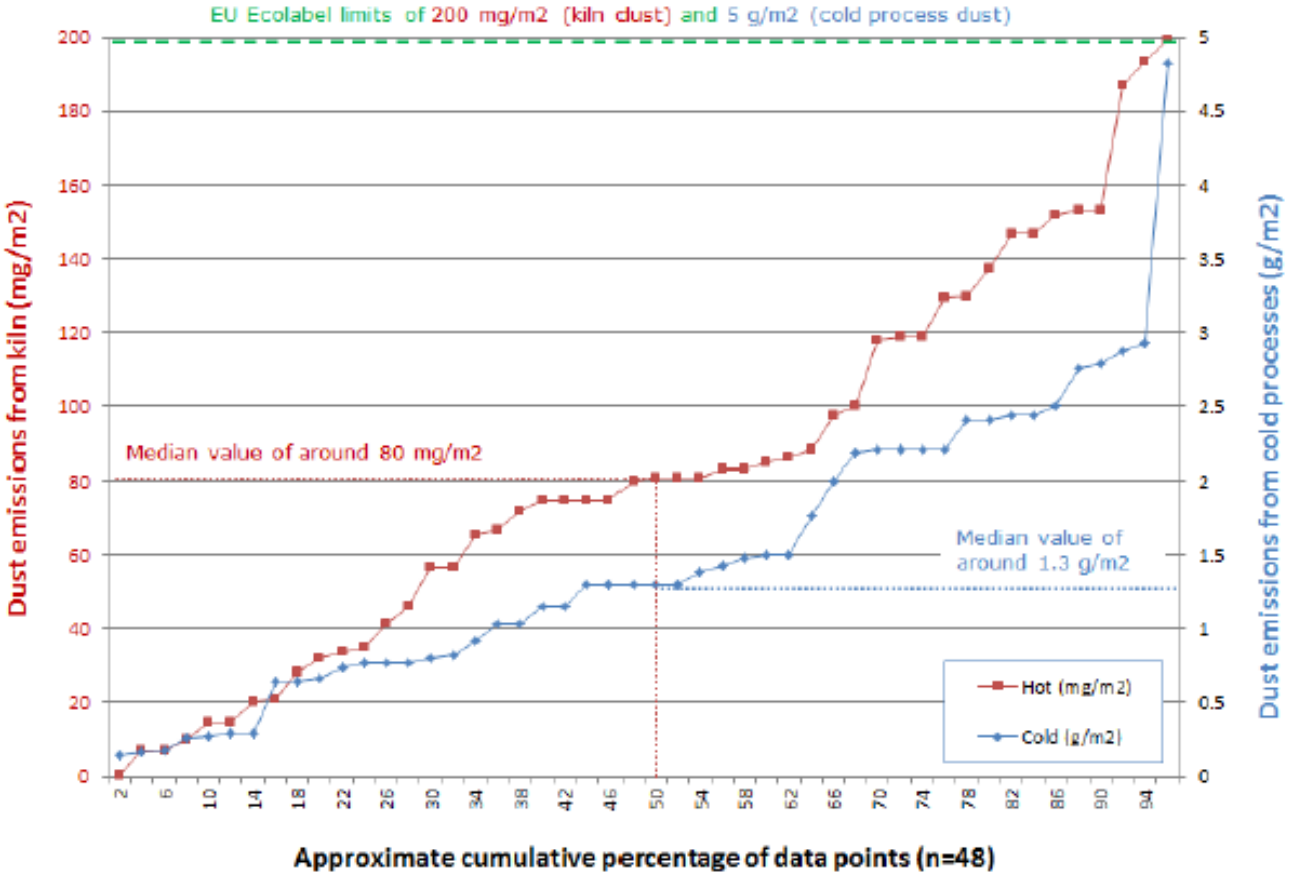
Ceramic criteria 4.4 Emissions of dust

Spread of EU Ecolabel license data used to set mandatory limit and environmental excellence threshold (license holder median).

Lower cold emission limit from 5 to 3...

Where do dust emissions from shaping go (hot or cold stack?).

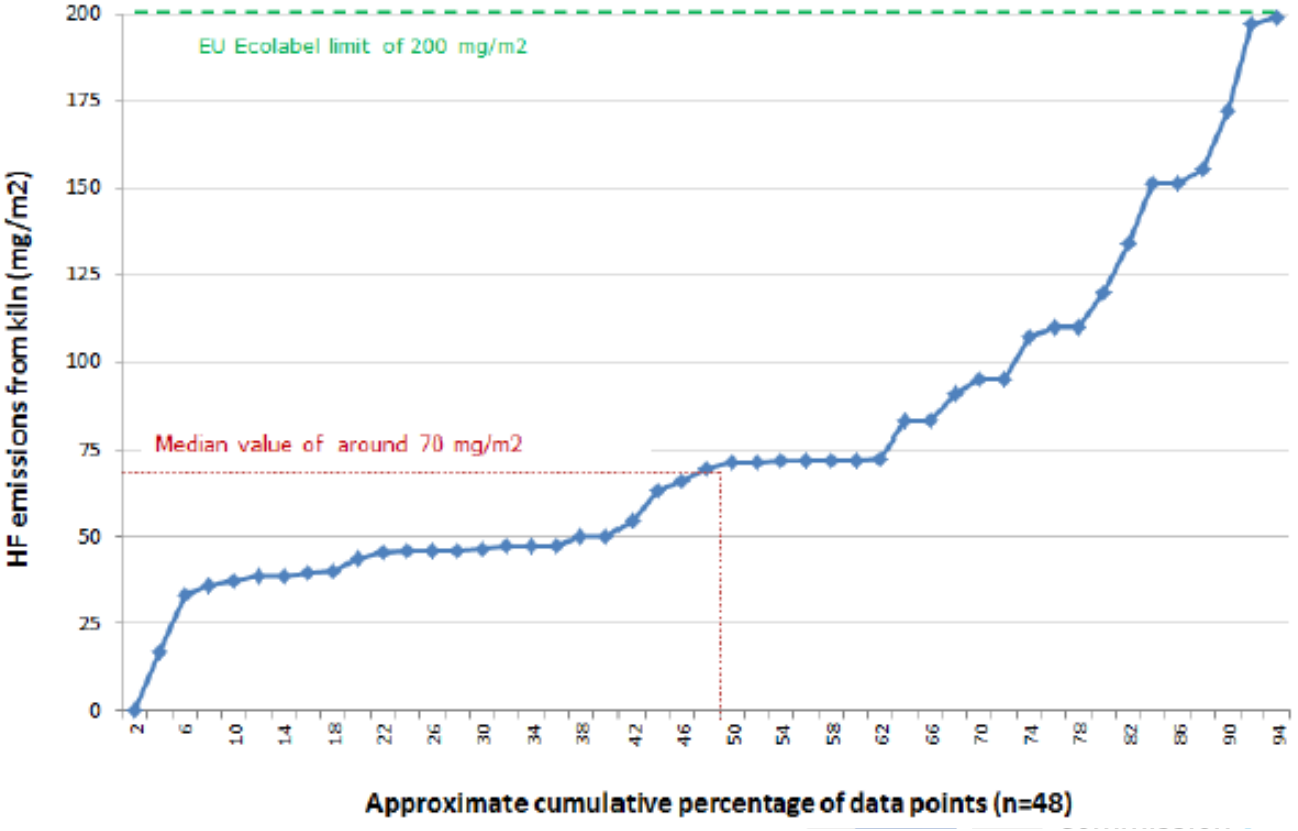
May explain difference in EUEL and ISO 17889-1.



Ceramic criteria 4.4 Emissions of HF

Spread of EU Ecolabel license data used to set mandatory limit and environmental excellence threshold (license holder median).

For all limits, switching from mg/m2 to mg/kg is made by multiplying by 0.05 m2/kg or, viceversa, multiplying by 20 kg/m2.



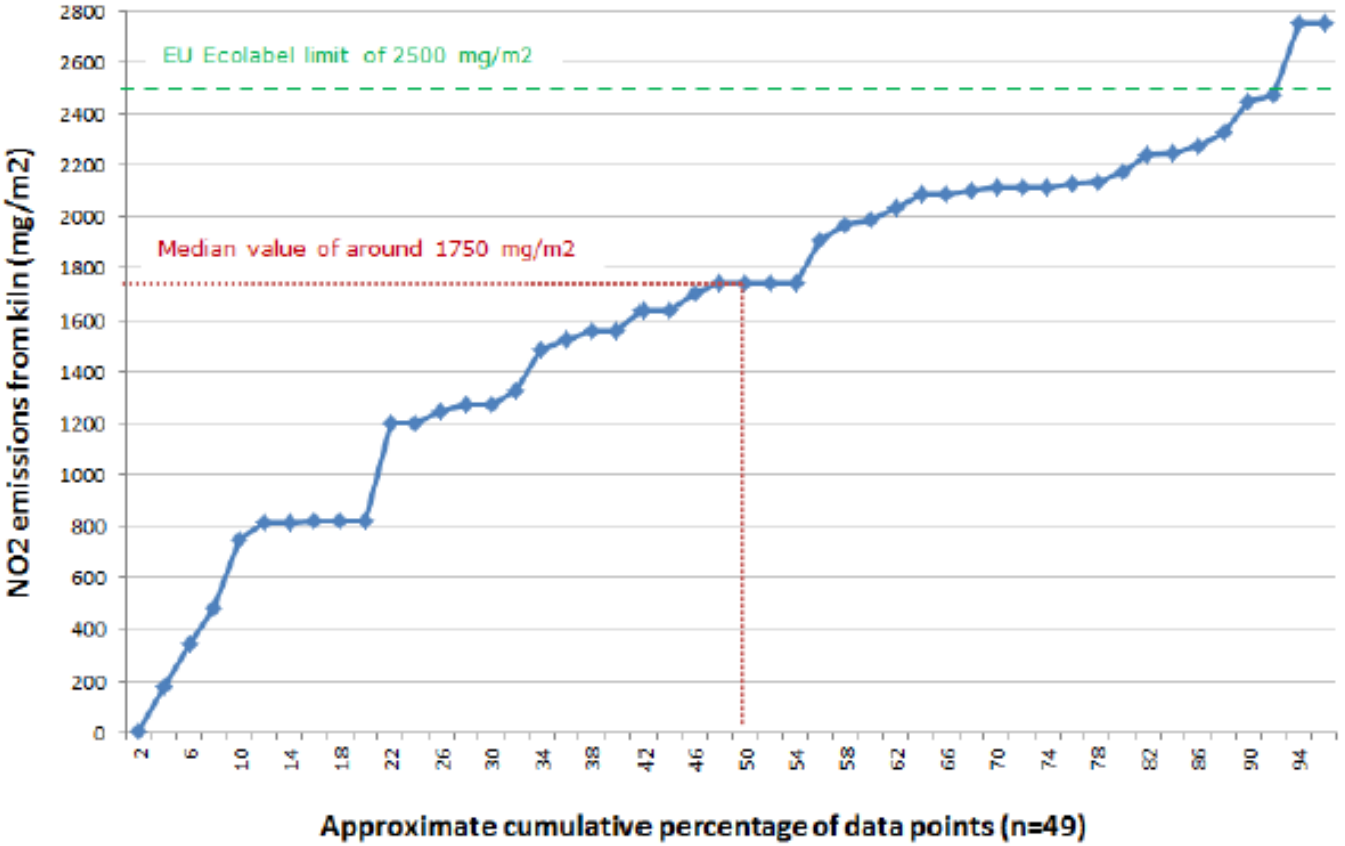
Ceramic criteria 4.4 Emissions of NOx

Some abnormally low data here (low firing temperatures maybe?).

NOx limit should not be reduced.

Maybe even increased to 2800/3000...

No an emission that can be easily abated without other impacts like ammonia release



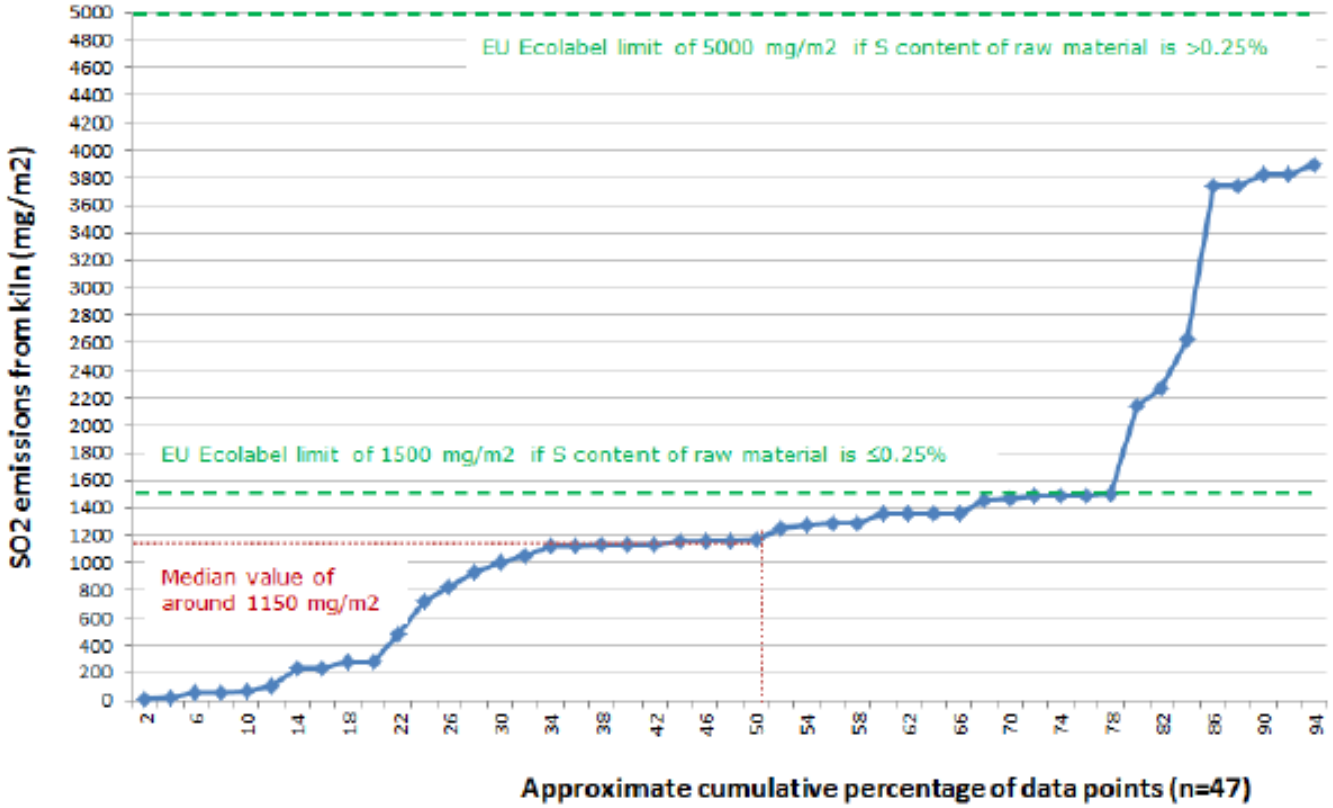
Ceramic criteria 4.4 Emissions of SOx

Clearly some values relate to raw materials with S content >0.25% (i.e. The 8 points >1500).

Maybe others as well that were <1500.

A shame that no S content specified with data (correlation plot could have been interesting).

Maybe S limit for cases when S is >0.25% can be lowered to 4000mg/m2



Ceramic criteria 4.5 Wastewater management

- Exemption from this requirement if no wastewater is discharged (comon sense).
- Limits apply in cases where wastewater is discharged (weekly analysis unless operating permit says otherwise).
- Apparently discharge is not common in ceramic tile production.
- What about in roof tile, brick and block production?
- If discharge is not common in those sectors either, JRC would propose to remove this criterion.

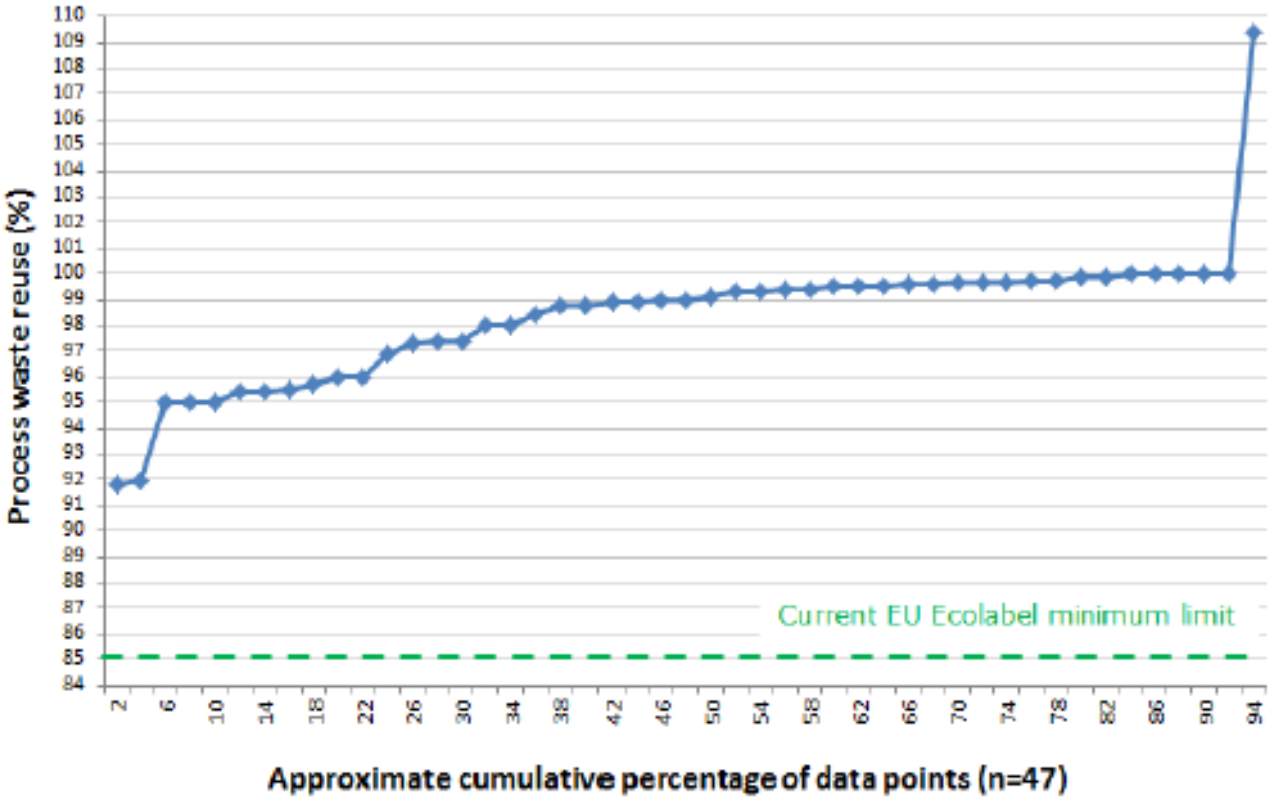
Ceramic criteria 4.6 Process waste reuse

Best in class is 109% waste recycling...

License holder data shows a consistent performance well above 85%.

Mandatory threshold could be raised to 90%

Up to 10% going from 90% to 100%



Ceramic criteria 4.7 Glazes

- Migration testing removed
- Essentially a non-use of glazes with intentionally added Pb or Cd.
- No points associated.

Ceramic criteria 4.4 to 4.7

- 4.4. Emissions of dust, HF, NO2 and SOx
- 4.5 Wastewater
- 4.6 Process waste reuse
- 4.7 Glazes

5. Pre-cast concrete – scoring overview

	Concrete hard covering products
1.1. Environmental Management System	Up to 5 points
1.4. VOC emissions	Up to 5 points
5.1. Clinker factor of cement	Up to 25 points
5.2. CO2 emissions from the cement kiln	Up to 25 points
5.3. Non-CO2 emissions from the cement kiln	Up to 15 points
5.4. Concrete recovery and responsible sourcing of raw materials	Up to 25 points
5.5. Concrete plant energy management	Up to 25 points
5.6. Environmentally innovative concrete product designs	Up to 10 points
Total points available	**135**
Minimum points needed for EU Ecolabel	**60**

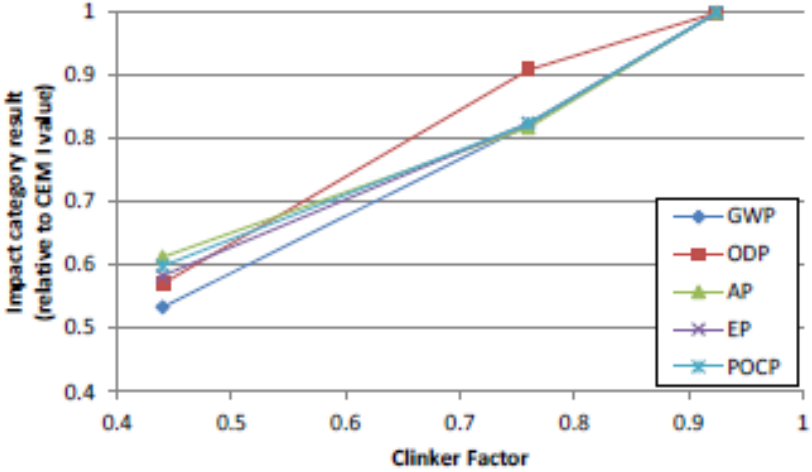
- Around 50% of points depend on supply side (cement choice)

4. Pre-cast concrete: key changes since TR v1.0

- Significant further research into GNR data to adjust and better justify ambition level for net CO2 emissions of cement.
- Dust, SOx and NOx emissions considered in light of BREF limits and CEMBUREAU data.
- Towards a single NOx limit (but upper limit needs further discussion)
- Consultation about responsible sourcing of aggregates and cement, looking for alignment/synergy with the Concrete Sustainability Council initiative here.
- Environmentally innovative concrete products considered in more detail (but photocatalytic ones, based on TiO2 at least, are no longer in the scope for EU Ecolabel).

Concrete criteria 5.1 Clinker factor

- Strong influence on envi. impact
- Can vary widely:
  - **At national/regional market level**
  - **At level of individual cement plant**



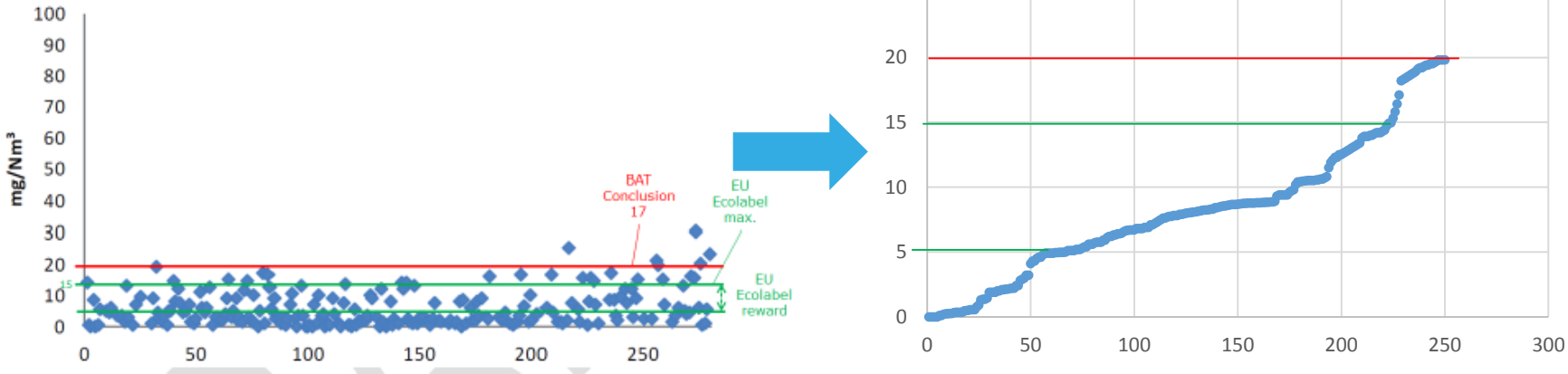
- All cements will deliver at least 2 out of 25 points thanks to blending with gypsum/hemihydrate.
- Assumed factors in TR v2.0 adjusted to assume a 3-4% gypsum/hemihydrate content in all cement classes.

Concrete criteria 5.2 cement kiln CO2

- THE hot-spot for concrete CO2 emissions
- Cross-checked with GNR database
- Mandatory requirement = needs to be within top 75%
- Maximum points = needs to be within top 25%
- Points awarded proportionally in-between
- Need for separate limits for white cement
- Need for separate approach for alternative cements (i.e. CO2 hot-spot will be chemical activator/curing method, not kiln).

Concrete criteria 5.3 Emissions of dust, NOx and SOx from kiln

- Using CEMBUREAU data as a basis
  - **Would it be possible to receive anonymised data in excel format? (or at least simply plotted in ascending order?)**

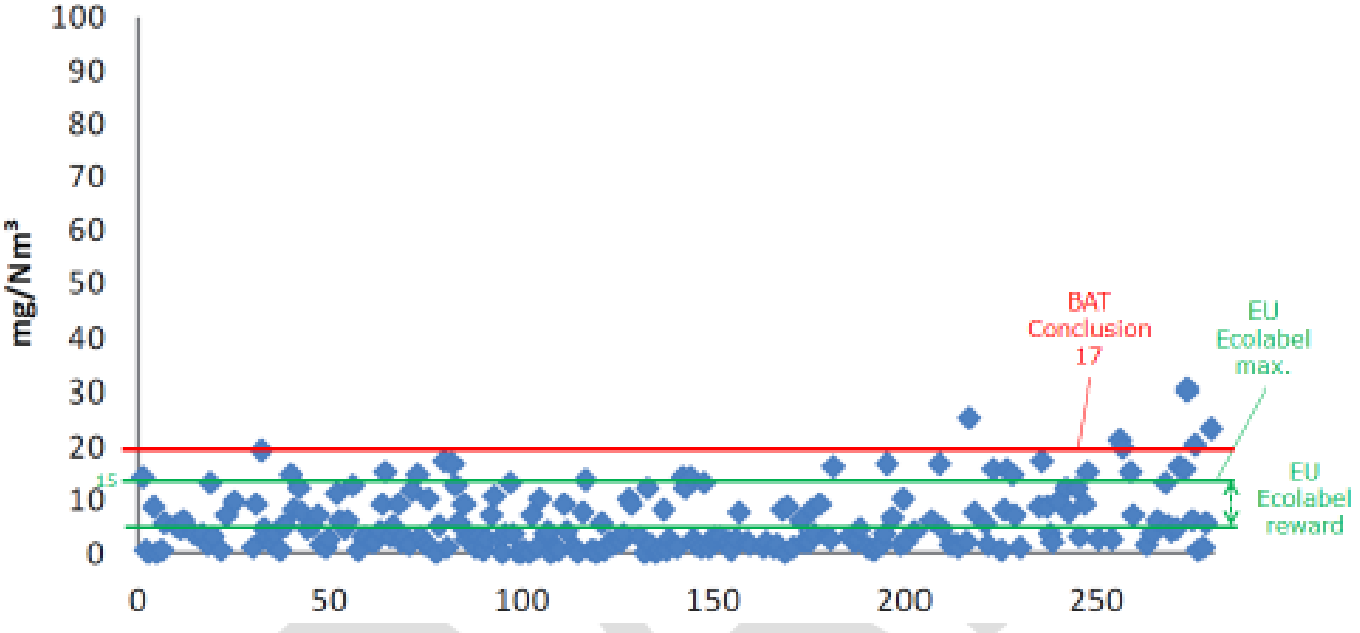


European Commission

Concrete criteria 5.3 Emissions of dust from kiln

- Difficult to see top 75% and tops 25% from graph...

- So instead, 75% of BAT-AEL upper limit has been used.
- Seems to correspond to top 90% of market (i.e. about 25 points above line at 15 mg/Nm3).
- Maximum points set at 25% pf BAT-AEL upper limit.

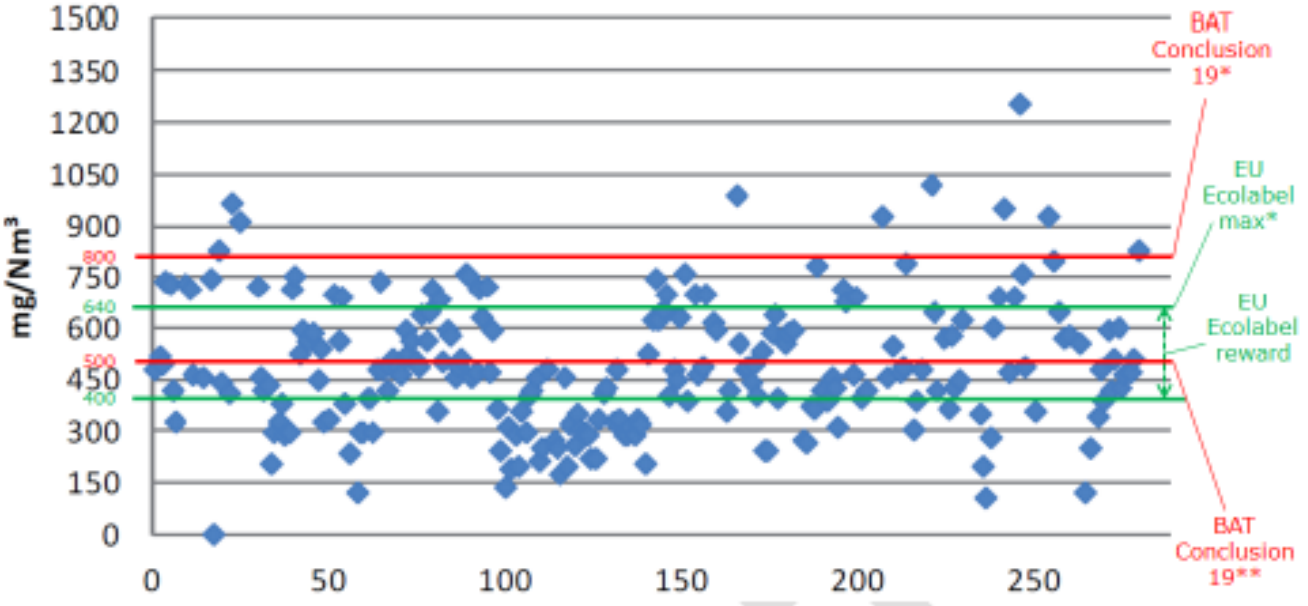


European Commission

Concrete criteria 5.3 Emissions of NOx from kiln

- A more complex issue than dust: 2 BAT upper AELs...

- Data points do not say which BAT AEL applies to it. Could easily be half and half?
- Ideally set a single value for EUEL.
- Mandatory EUEL limit removes around 17% of kilns...
- Maybe exceptions to mandatory limit for EUEL could be defined based on kiln type?

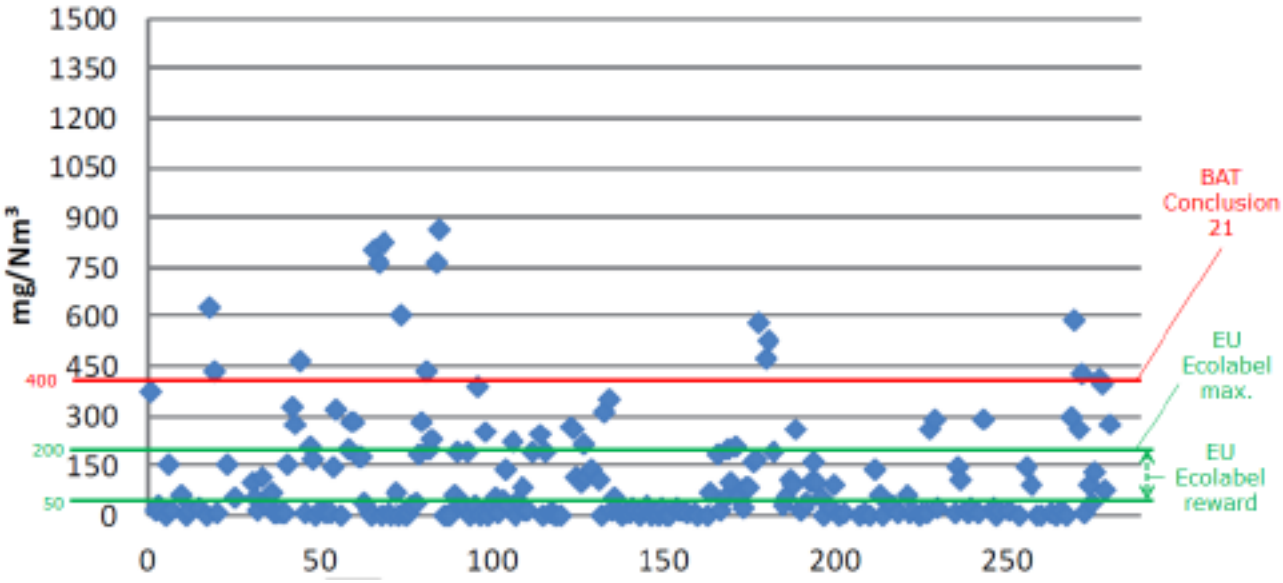


European Commission

Concrete criteria 5.3 Emissions of SOx from kiln

- Possible trade-off here with low CO2 (e.g. RDF and biomass)?

- Proposed EUEL mandatory limit is half of BAT upper AEL.
- Mandatory EUEL limit removes around 20% of kilns...(but is 50% lower than BREF upper AEL)
- Difficult to identify the top 25% due to overlap of data points (threshold is 12.5% of BREF upper AEL).



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Discussion on criteria 5.1 to 5.3?

- Cement clinker factor
- Net CO2 emissions from cement kiln
- Non-CO2 emissions to air from cement kiln:
  - **Emissions of dust from cement kiln**
  - **Emission of NOx from cement kiln**
  - **Emissions of SOx from cement kiln**

Concrete criteria 5.4: Concrete recovery and responsible sourcing of raw materials

Mandatory:

Basically to recycle all process waste

(i.e. Returned or rejected concrete batches)

Clear resource efficiency and circular economy link

Also links to CSC initiative.

Optional:

- Recycled content up to 30% (up to 15 pts)
- Responsibly sourced cement up to 100% (up to 5 pts)*
- Responsibly sourced aggregates up to 100% (up to 5 pts)*
- Links to the CSC initiative as well
- Optional because recycled content is not always the greenest choice!
- Responsible sourcing certification is still growing

Concrete criteria 5.5: Concrete plant energy management

TR v1.0

Mandatory element:

Specific energy inventory (12 months).

Optional elements:

Up to 50% electricity via CHP: Up to 10 pts

Renewable elecricity: Up to 15 pts for 90% renewable.

TR v2.0

Mandatory element:

Specific energy inventory (12 months)

Optional element:

Renewable electricty: Up to 25 points for 100% renewable.

- Main difference is that now CHP is not rewarded.
- Apparently not widely used in pre-cast industry (but at the same time it was only an optional requirement....).

Concrete criteria 5.5: Concrete plant energy management

Is CHP still worth looking at?

- Table 35, page 232 of TR v2.0.
- heat: electricty ratios
- Masonry unit:
- heat: elec = 5:1,
- Pre-cast plant:
- heat:elec. = 3:1
- Typical CHP output:

  heat:elec 3:1

heat

		Masonry	Pre-cast
Concrete plant energy (GJ/100 units† or GJ/m3 concrete) (% of total plant energy)	Vehicles (fuel)	0.0793 GJ/100 units 24.4 %	0.2648 GJ/m3 32.3%
	Curing (fuel)	0.2019 GJ/100 units 62.2%	0.3584 GJ/m3 43.7%
	Heating + other (fuel)		0.0590 GJ/m3 7.2%
	Plant (electricity)	0.0433 GJ/100 units 13.3%	0.1371 GJ/m3 16.7%
	Plant total	**0.3245 GJ/100 units 100%**	**0.8193 GJ/m3 100%**
	Fuel : elec. ratio	86.7 : 13.3 (6.5 : 1)	83.3 : 16.7 (5 : 1)

electricity

Concrete criteria 5.6: Environmentally innovative (pre-cast) concrete designs

TR v1.0

Optional elements:

1. Photocatalytically active surface
   → up to 10 pts
2. Void content up to >5%
   → up to 10 pts
3. Infiltration rate >400mm/h and up to 2000mm/h
   → up to 10pts

TR v2.0

Optional element:

1. Void content at least 20% and up to 80% or more:
   → up to 10 pts
2. Grass pavers:
   → 10 points

3. Infiltration rate >400mm/h and up to 2000mm/h
   → up to 10pts

Discussion on criteria 5.4 to 5.6?

- Concrete recovery and responsible sourcing
- Concrete plant energy management
- Environmentally innovative (pre-cast) concrete products

2. Natural stone: 2 types of license possible:

1. Ornamental / Dimension stone

- Big blocks, often 2x2x3m
- Product of **quarry**

2. Natural stone hard coverings

- Bricks, blocks, slabs, tiles etc.
- Product of **transformation plant**

2. Natural stone – scoring overview

	Dimension or ornamental stone blocks	Natural stone tiles, slabs, bricks, blocks and masonry units
1.1. Environmental Management System	Up to 5 points	Up to 5 points
1.4. VOC emissions	n/a	Up to 5 points
2.1.1. Quarry landscape impact ratio	Up to 30 points	Up to 30 points
2.1.2. Material efficiency	Up to 30 points	Up to 30 points
2.1.3. Water and waste water management	0 points	0 points
2.1.4. Quarry dust control	0 points	0 points
2.2.1. Energy consumption	n/a	Up to 20 points
2.2.2. Water and waste water management	n/a	Up to 10 points
2.2.3. Dust control	n/a	0 points
2.2.4. Transformation waste reuse	n/a	Up to 20 points
Total points available	**65 (not 60)**	**120 (not 110)**
Minimum points needed for EU Ecolabel	**32 (not 30)**	**60 (not 55)**

- Up to 50% of points depend on supply side (quarry)

2. Natural stone: key changes since TR v1.0

- Quarry visual impact indicator replaced by a beneficial land use ratio.
- Exemption to minimum material efficiency for slate.
- Quarry water criteria → good management approaches
- Quarry dust emissions → good management approaches

2. Natural stone: 2.1.1 Quarry landscape impact ratio

Mandatory requirement

- Basically to calculate the ratios QFA and BLU

Optional requirement

- Up to 10pts for a QFA ≤0.20 (0pts if ≥0.60)
- Up to 20pts for a BLU ≥0.40 (0pts if 0.00)

BLU is new (replaces quarry visual impact)

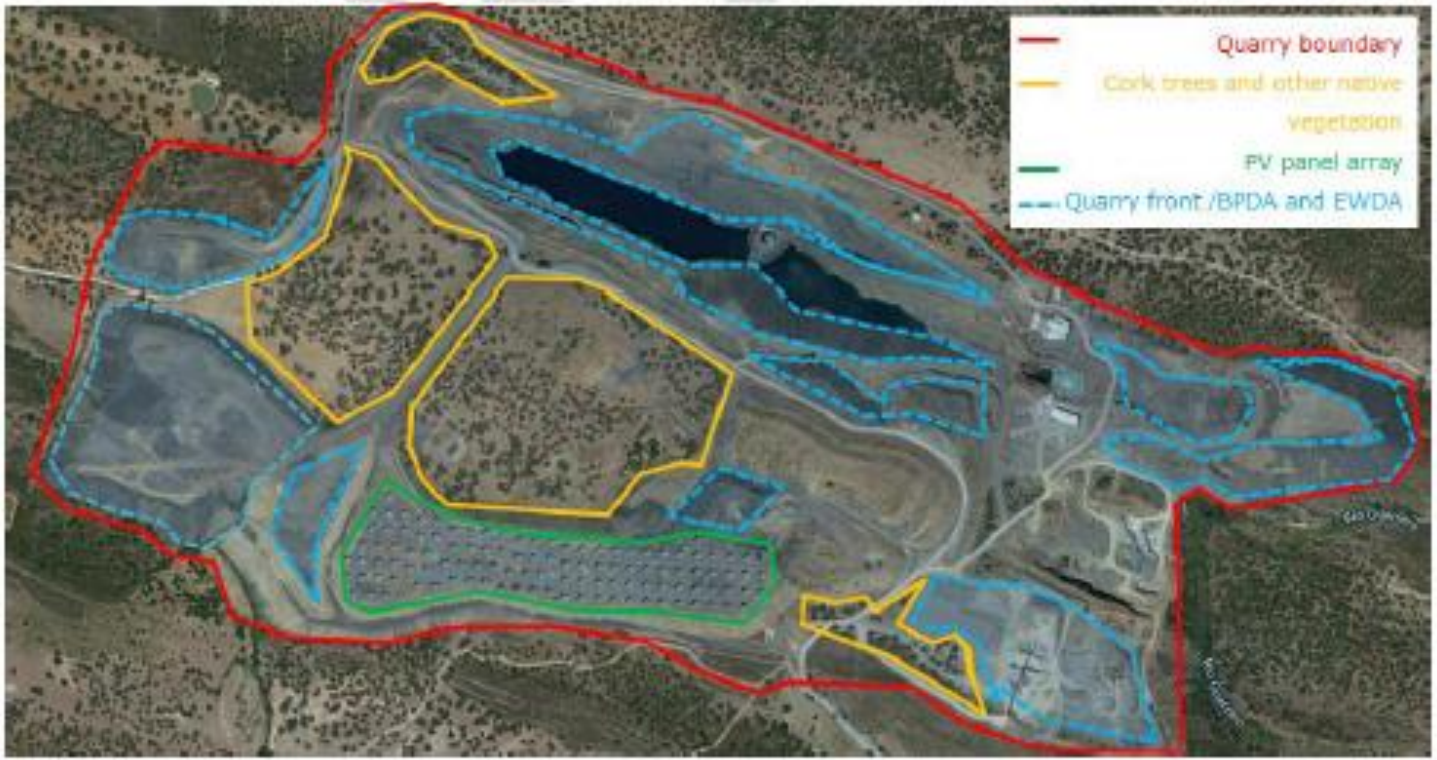
No mandatory requirement for ratios set since only 1 quarry approved under old criteria!

2. Natural stone: 2.1.1 Quarry landscape impact ratio

What are we looking for in these ratios?

QFA =
Blue / Red

BLU =
Yellow+Green / Red



2. Natural stone: 2.1.2 Material efficiency

Mandatory requirement

- Extraction efficiency of ≥0.25 (except slate)

Optional requirement

- Extraction efficiency of up to 0.50 (up to 20 pts)
- Useful by-product ratio of up to 0.60 (up to 10pts)

Main change from TR v1.0 to v2.0 is exemption for slate

Key aspects due to influence on overall LCA impact of final products.

2. Natural stone: 2.1.3 Water and wastewater management

Moved away from quantitative monitoring approach (i.e. Recycling ratio and TSS in discharged effluent/runoff) in 2009 Decision to a good management-based approach.

Why?

- Closed loop water systems in use already for collected wastewater (i.e. recycling ratio near 100%).
- Discharges from quarries only occur during storm, how to get any representative sample?
- Discharges are effectively surface runoff, solids could come from upstream sites not under applicant control

2. Natural stone: 2.1.3 Water and wastewater management

What good management approaches are asked for?

- Opportune collection of stormwater (all sites).
- Diversion of stormwater surface runoff stormwater away from ponds (all sites).
- Storage of water for cutting operations in impermeable container/pond (sites using wet-cutters).
- Cutting wastewater to be clarified (sites using wet-cutters).
- Sludge to be reused or disposed of correctly (sites using wet-cutters).

2. Natural stone: 2.1.4 Dust control

Moved away from quantitative monitoring approach (i.e. Dust sampling from air) in 2009 Decision to a good management-based approach.

Why?

- Dust sources are diffuse but sampling point is fixed, so where to place sampling point? Who decides? How to know if neighboring sites are contributing to measurements?
- Results can vary depending on weather variables (e.g. humidity, rain, wind speed and direction).

2. Natural stone: 2.1.4 Dust control

What good management approaches are asked for?

- Dust suppression sprays or vacuum hood for all operations that are main sources of dust (e.g. cutting, crushing, screening) (all sites).
- Have an operation plan in place for different weather conditions to minimise dust emissions (all sites).
- Incorporate wind protection features onsite (all sites).
- Enclosed storage of dewatered sludge (wet cutting sites only).
- Training and PPE provision for staff (all sites).
- Paving of heavily used roads (all sites).

Discussion on criteria 2.1.1 to 2.1.4?

- Quarry footprint and beneficial land use ratios
- Material efficiency (of block extraction)
- Water and wastewater management and site features
- Dust control

2. Natural stone: 2.2.1 Transformation plant energy requirements

Mandatory requirement

- Energy inventory

Optional requirement

- Up to 20pts for up to 100% renewable elec. (0pts if 0%)

Similar requirement as for pre-cast concrete plant

But CHP is definitely not appliable to this activity

2. Natural stone: 2.2.2 Transformation plant water and wastewater management

Mandatory requirement

- Description of and implementation of wastewater treatment onsite for water recovery and solids separation.
- If any discharged effluent, limits apply for TSS? COD? Cr(VI) and Fe (only TSS and COD if discharged via municipal wastewater plant).

Optional requirements

- Points for water reuse for cutting and dust control, but no recycling ratio (complicated due to polishing)
- Points for rainwater collection

2. Natural stone: 2.2.3 Transformation plant dust control

Mandatory requirements

All good practice related:

- Dust suppression sprays or vacuum hoods in working areas
- Floor cleaning techniques
- Enclosed storqge of dewatered sludge
- Paving of heavily trafficked roads
- Training and PPE for employees and visitors

No quantitative requirements because activitis are highly heterogeneous, both in time and space

2. Natural stone: 2.2.4 Transformation plant waste reuse

Mandatory requirements

- Process waste inventory (scrap and sludge).
- At least 80% reuse of process scrap in other applications (e.g. aggregates) or stored onsite for future sale/use.

Optional requirements

- Up to 10pts for exceeding 80% process scrap reuse (up to 100%).
- Up to 10pts for any process sludge reuse (≥0% up to 100%)

Process sludge is harder to reuse….flocculants an issue?

Discussion on criteria 2.2.1 to 2.2.4?

- Energy
- Water / wastewater management
- Dust control
- Process scrap / sludge reuse

Thanks

Any questions?

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