Für Mensch & Umwelt

Umwelt Bundesamt

20th Joint EIONET & UNECE TFEIP Meeting – Thessaloniki
Combustion and industry expert panel

Several projects
PCB issues
TSP heated filter vs dilution tunnel

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Section V 1.6 - Emissions Situation

Paper on improving Emissions of Condensable Particulate Matter in the Context of the LRTAP Convention

- **2019**: At the 2019 TFEIP meeting, the updated Guidebook chapters will be presented for endorsement. information will be disseminated to Parties, explaining that best practice is to report PM emissions from small-scale combustion with the condensable component of PM included, and that the information in the Guidebook has been updated to specifically support this.
-

- Long-Term (2022 onwards):
  - Following the Guidebook update, Stage 3 checks can be used to support the long-term aim of all Parties standardizing their reporting of PM emissions according to best practice, and in particular that they will include the condensable component for estimating PM emissions from small-scale combustion, road transport and non-road mobile machinery. This may be challenging for Parties that currently use country-specific PM EFs.

German proposal

The TFEIP will oversee an update to the EMEP/EEA Guidebook (GB) chapters on small-scale combustion so that it clearly illustrates the issue regarding the inclusion of the condensable component in emission estimates for this source and clarifies that current estimates might not be comparable.
For the emission factors presented in the GB, it will be clearly stated in each case if the condensable component is included and default values for both options will be presented where possible. Further, the GB will allow parties to use either option for emission calculation from small combustion, but will require the publication of conversion factors in case countries use default or country specific factors representing the filterable component only. These factors could either represent a multiplicator to filterable PM or the condensable fraction of NMVOC. The GB will also provide default conversion factor values. Using these country-specific (or default) factors, modelers will be able to derive the model input needed for their work.

Why can we not implement condensable emission factors?

- **Heated filter is the standard measurement method in Germany used by chimney sweepers at test benches for measurement projects for many years, the limit value refers to heated filter measurement – many data are available which couldn't be used any more**

→ **BACK TO TIER 1 (key source)**

- **According to the 1. Federal Emission Control Act many old stoves have to be decommissioned – they cannot be measured any more with dilution tunnel**

→ **DESTROYING TIME SERIES CONSISTENCY**

- **NEC reduction targets refer to the base year 2005 which couldn't be recalculated by using an emission factor including condensable particles – methodical differences**

→ **OPPORTUNITY FOR MANIPULATION**

How can we help to solve modelling problems?

Knowledge is still limited –
every conversion is very uncertain

- **Information from modelers to inventory compiler about the gap between emission inventories and TSP concentrations**
- **Measurements needed with heated filter and dilution tunnel under the same conditions**
- **Analyses of NMVOC in order to find out which components are condensable**
- **Stoves which are exported to countries with another measurement standard have to be measured by both methods**
- **Results of the EN-PME project**

Large combustion plants (1)

INITIAL SITUATION:

- **≈ data on 600 plants LCP data base (POSO)**
- **PRTR data**
- **Emission reports (every 4 years)**

PREVIOUS APPROACH:

- **Research projects**

IDEA:

- **Getting an own understanding of all data including all background tables**
- **Providing a detailed documentation**

Large combustion plants (2)

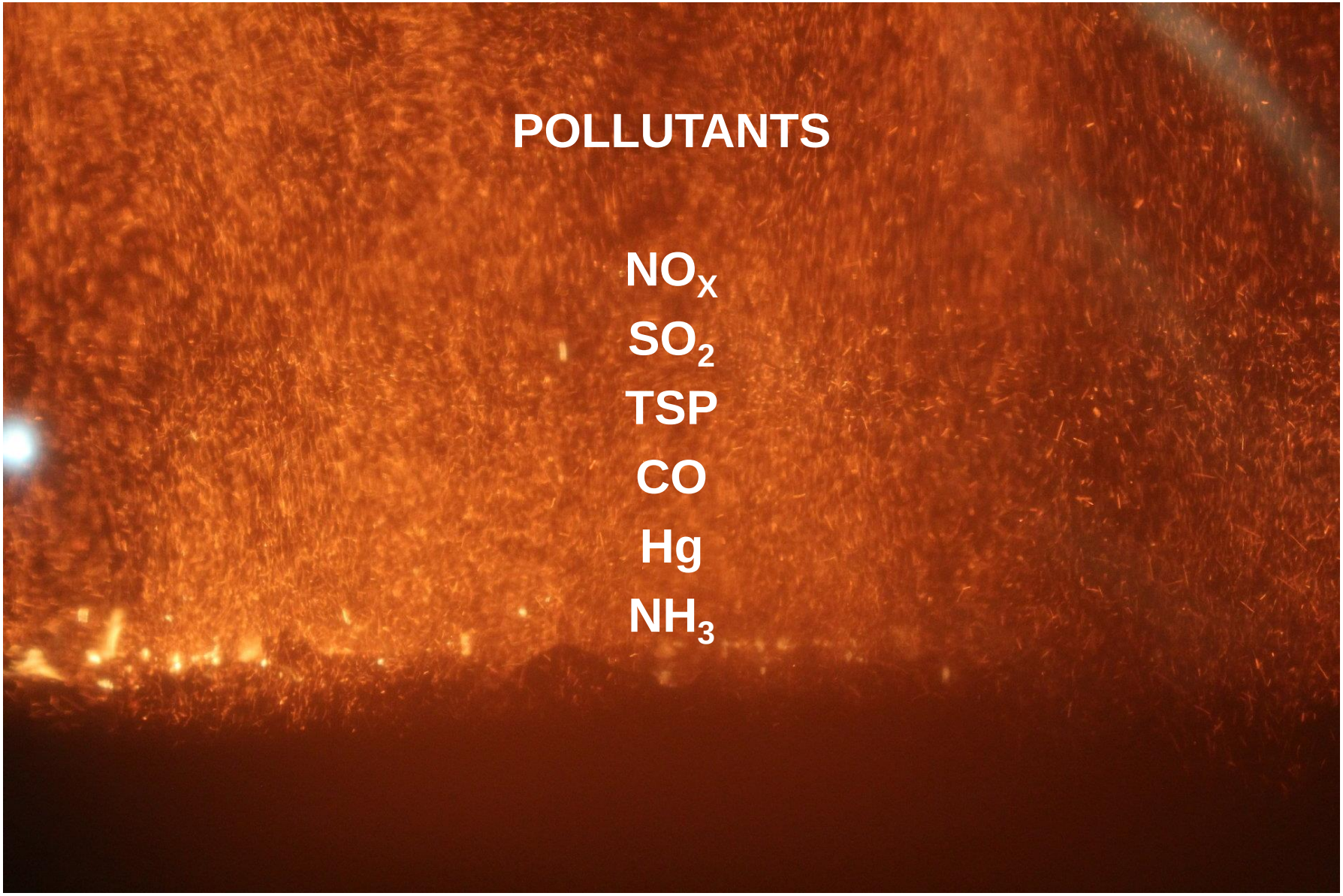
DIFFERENT PLANT TYPES:

- traditional power plants (steam turbine)
- Gas turbines
- Combined cycle
- District heating plants
- Compressor stations
- Process furnaces (chemical industry)

FUELS:

- Lignite (distinguished by different regions)
- Hard coal
- Blast furnace gas & coke oven gas
- Natural gas
- Fuel oil
- Residual gases from chemical industry

Large combustion plants (3)



Large combustion plants (4)

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German Informative Inventory Report

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1.A.1.a - Public Electricity And Heat Production

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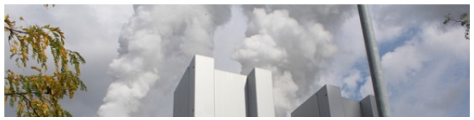
Last updated on 16 Apr 2019 (cf. Authors)

Short description

Source category *Public Electricity and Heat Production (1.A.1.a)* comprises district heating plants and electricity and heat production of power plants. Waste incineration is also included.

NFR-Code	Name of Category	Method	AD	EF	Key Categyory [1]
1.A.1.a	Public Electricity and Heat Production	T2	NS	CS	**L & T**: NO_x, SO_x, TSP, PM_{10}, $PM_{2.5}$, Hg, Cd, PCDD/F | **L**: CO, HCB

+ Show Legend



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WILL BE PUBLISHED HERE

Bibliography

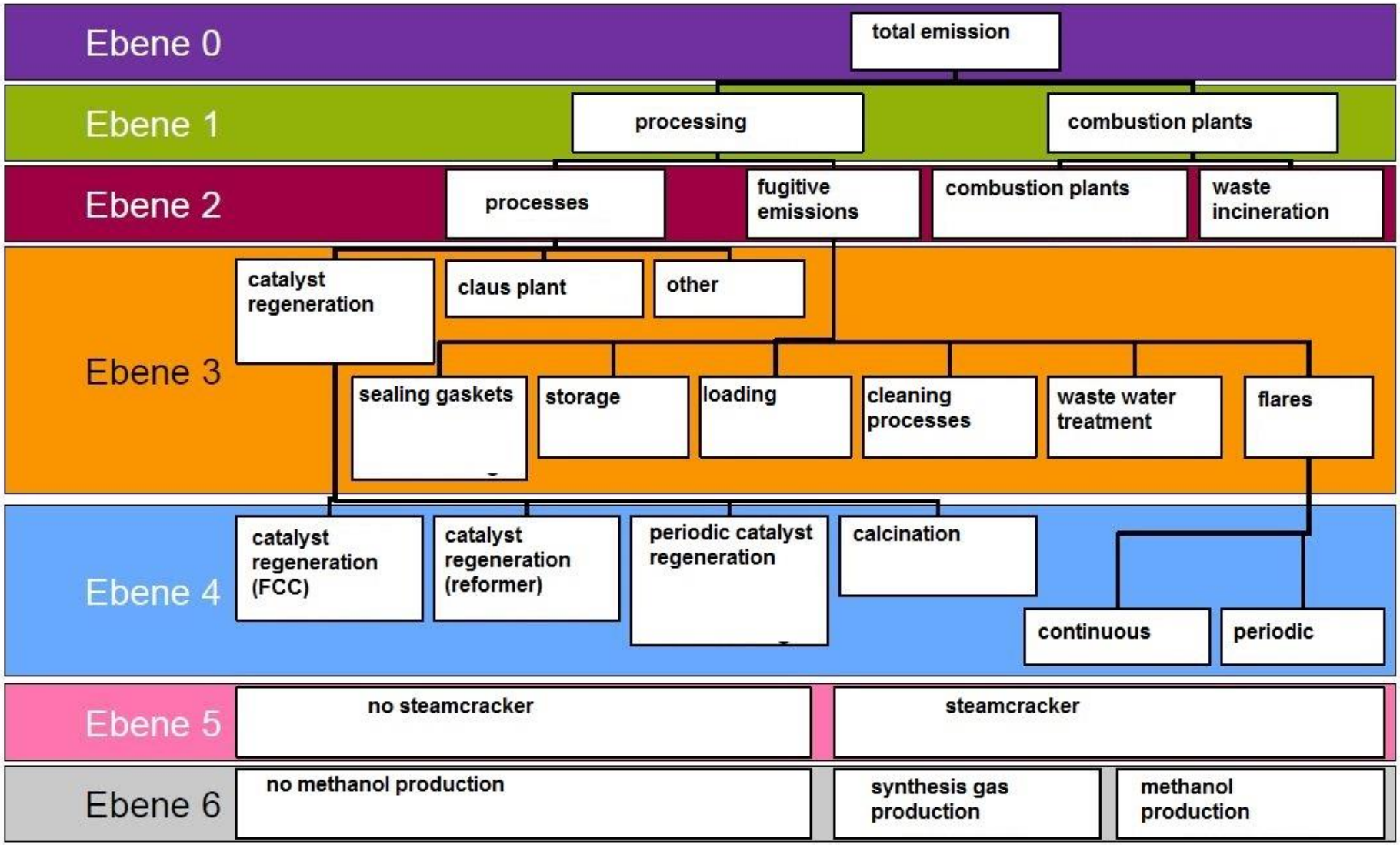
1. AGEB, 2017: National energy balance and Satellite balance for renewable energy: http://www.ag-energiebilanzen.de/7-1-Energy-Balance-2000-to-2015.html
2. DESTATIS, 2017: Statistisches Bundesamt, Fachserie 19, Reihe 1: Abfallentsorgung - URL: http://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Umwelt/Wasserwirtschaft/_inhalt.html#sprg238684
3. Rentz et al., 2002: Rentz, O. ; Karl, U. ; Peter, H.: Ermittlung und Evaluierung von Emissionsfaktoren für Feuerungsanlagen in Deutschland für die Jahre 1995, 2000 und 2010: Forschungsbericht 299 43 142; Forschungsvorhaben im Auftrag des Umweltbundesamt; Endbericht; Karlsruhe: Deutsch-Französisches Inst. f. Umweltforschung, Univ. (TH); 2002
4. IZT, 2009: Stationary engines: FKZ 3707 42 103/01 "Aufbereitung von Daten der Emissionserklärungen gemäß 11.BImSchV aus dem Jahre 2004 für die Verwendung bei der UNFCCC- und UNECE-Berichterstattung/ Teilbericht Stationäre Verbrennungsmotoren", Melanie Degel, Wolfram Jörß https://www.umweltbundesamt.de/en/publikationen/stationaere-verbrennungsmotoren
5. Fichtner et al., 2011: W. Fichtner, U. Karl, R. Hartel, D. Balussou: Large and medium combustion plants, including gasturbines: FKZ 3708 42 301, "Fortschreibung der Emissionsfaktoren für Feuerungs- und Gasturbinenanlagen nach 13./17. BImSchV und TA Luft"; DFIU, KIT, and EIFER, 2011; not published
6. ATZ, 2010: Waste incineration: FKZ 3708 49 1075 "Überprüfung der Emissionsfaktoren für die Abfallverbrennung"; ATZ Entwicklungszentrum, Robert Daschner, Prof. Dr. Martin Faulstich, Prof. Dr. Peter Quicker, Samir Binder: not published

Refinery project (1)

- **Data source: emission reports (2004, 2008, 2012, 2016)**

- **Very comprehensive reports (more than 200 pages for one refinery)**

Refinery project (2)



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Refinery project (3)

SO_2 emission factors of refinery gas

Brennstoff	Parameter	n	$Q_{50\,\%}$	$\bar{x}$	95 % Konfidenzint. min.	95 % Konfidenzint. max.	gew. ø
	Einheit	[-]	[kg·TJ(Brennstoff)$^{-1}$]				
	Jahr						
Raffineriegas	2004	97	6,72	23,32	3,51	43,13	26,66
	2008	87	7,17	13,48	8,97	17,98	10,21
	2012	70	4,73	14,48	3,79	25,17	12,36
	2016	66	2,54	10,44	4,79	16,09	8,75

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Default SO_2 emission factor = 0.281 g/GJ (kg/TJ)

LCP Measurement Project (running)

- **Heavy metals: Pb, Cd, As, Cr, Cu, Ni, Se, V, Zn**
- **POPs: PCDD/F, PCB, HCB, PAH (NFR 4)**
- **PM10 & PM2.5**
- **VOC and CH_4**

- **Information on NO_X, SO_2, TSP, CO and the specific flue gas volume from the operators**

Small combustion projects (1)

BASIC MEASUREMENTS OF DIFFERENT STOVES

IN ORDER TO REVIEW THE IMPLEMENTATION OF NEW LIMIT VALUES FOR SMALL WOOD COMBUSTION PLANTS

- **TSP (heated filter)**
- **CO**
- **OGC (VOC)**
- **NO_X**
- **Hopefully also N_2O, NH_3 and CH_4**

Small combustion projects (2)

PAH MEASUREMENTS OF SMALL COMBUSTION PLANTS USING WOOD AND BRIQUETTES

- **All 16 US EPA**

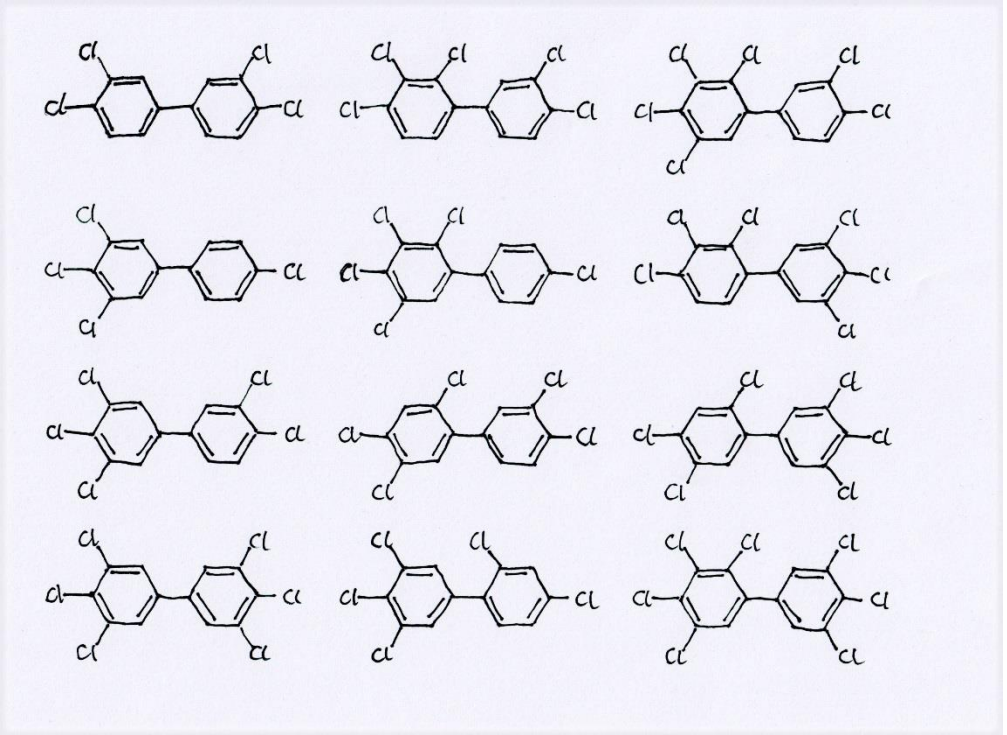
- **Ignition process and main combustion**

PCB Problems

DIFFERENT MEASUREMENT METHODS

AS A RESULT EMISSION FACTORS AND EMISSIONS IN A DIFFERENT ORDER OF MAGNITUDE

- **Waste incineration: 0.XY g**
- **Industrial processes: XY.XY kg**
- **PCB from product use: XY.XY tons**
- **Two PCB columns in the NFR tables?**



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Thank you very much for your attention

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