



Technical Assessment of IPCC Inventory Guidelines – Results of Questionnaire Survey Energy and IPPU

Side event during UNFCCC SB42, 4 June 2015, Bonn, Germany

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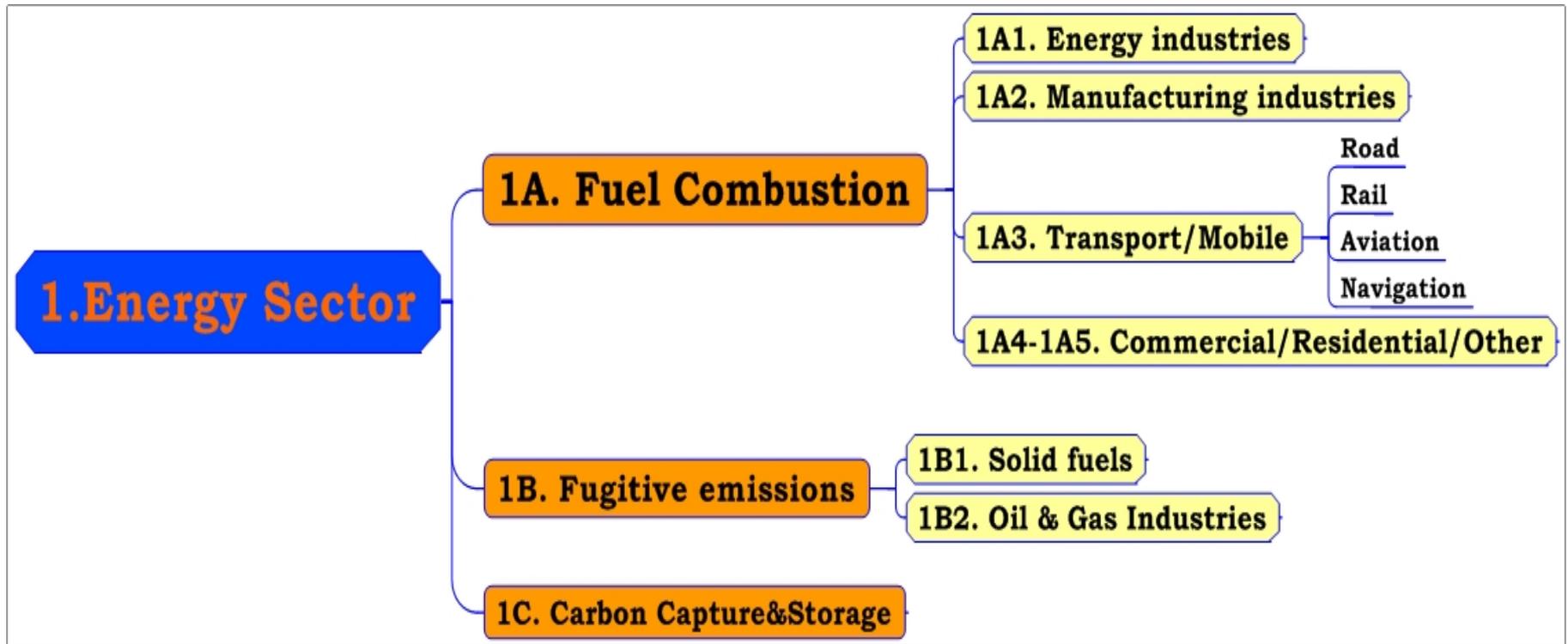
Technical Support Unit

IPCC Task Force on National Greenhouse Gas Inventories

ipcc

INTERGOVERNMENTAL PANEL ON climate change

Energy Sector



Energy

- 76 experts
- 206 comments
- 11 high priority issues

Energy Sector Category List	Comments
1 Energy	206
1.A Fuel Combustion Activities	98
1.A.1 Energy Industries	22
1.A.2 Manufacturing Industries and Construction	4
1.A.3 Transport	37
- Civil Aviation	6
- Road Transportation	24
- Railways	0
- Water-borne Navigation	4
- Other Transportation	2
1.A.4 Residential/Commercial/Agricultural	6
1.A.5 Other	3
1.B Fugitive emissions from fuels	74
1.B.1 Solid Fuels	14
- Coal mining and handling	7
- Uncontrolled combustion and burning coal dumps	0
- Solid fuel transformation	4
1.B.2 Oil and Natural Gas	50
- Oil	11
- Natural Gas	15
1.B.3 Other emissions from Energy Production	5
1.C Carbon dioxide Transport and Storage	7
Other Energy categories do not fall within any above	5

High priority issues: Stationary Combustion

- Comprehensive update, improvement and provision of standard NCVs and GCVs and carbon EFs
- Reconsideration and update of the default oxidation factors for fossil fuels (*which are 100% for all fuels*)
- Development of guidance for estimating emissions from biofuel and blends of fossil fuels

✓ *Definition of fuels*

High priority issues: 1A1 Energy Industries

- Development of guidance for estimating GHG emissions from catalyst coke incineration in the petroleum industries (*Petroleum Refining (1.A.1.b)*)
- Development of guidance for estimating GHG emissions from charcoal production (*Manufacture of Solid Fuels and Other Energy Industries (1.A.1.c)*)

High priority issues: 1A3 Mobile Combustion

- Addition or improvement of methods, activity data and emission factors reflecting the latest technology such as hybrid vehicle and actual status of the usage of vehicle in developing countries
- Development of guidance for estimating non-CO2 emissions from biofuel and blends of fossil fuels
 - ✓ *Definition of vehicles*

High priority issues: 1B Fugitive Emissions

- Update or addition of default emission factors of fugitive emissions from oil and gas by reflecting current practices and the latest measurement data
- Development of guidance for estimating GHG emissions from unconventional oil and gas production such as shale gas, shale oil, tight gas and tight oil
- Development of guidance for estimating GHG fugitive emissions from abandoned or decommissioned surface mines, oil and gas wells

High priority issues: 1B3. Geo

- Development of guidance for estimating GHG fugitive emissions from geothermal power plants

High priority issues: 1C. Carbon Capture and Storage

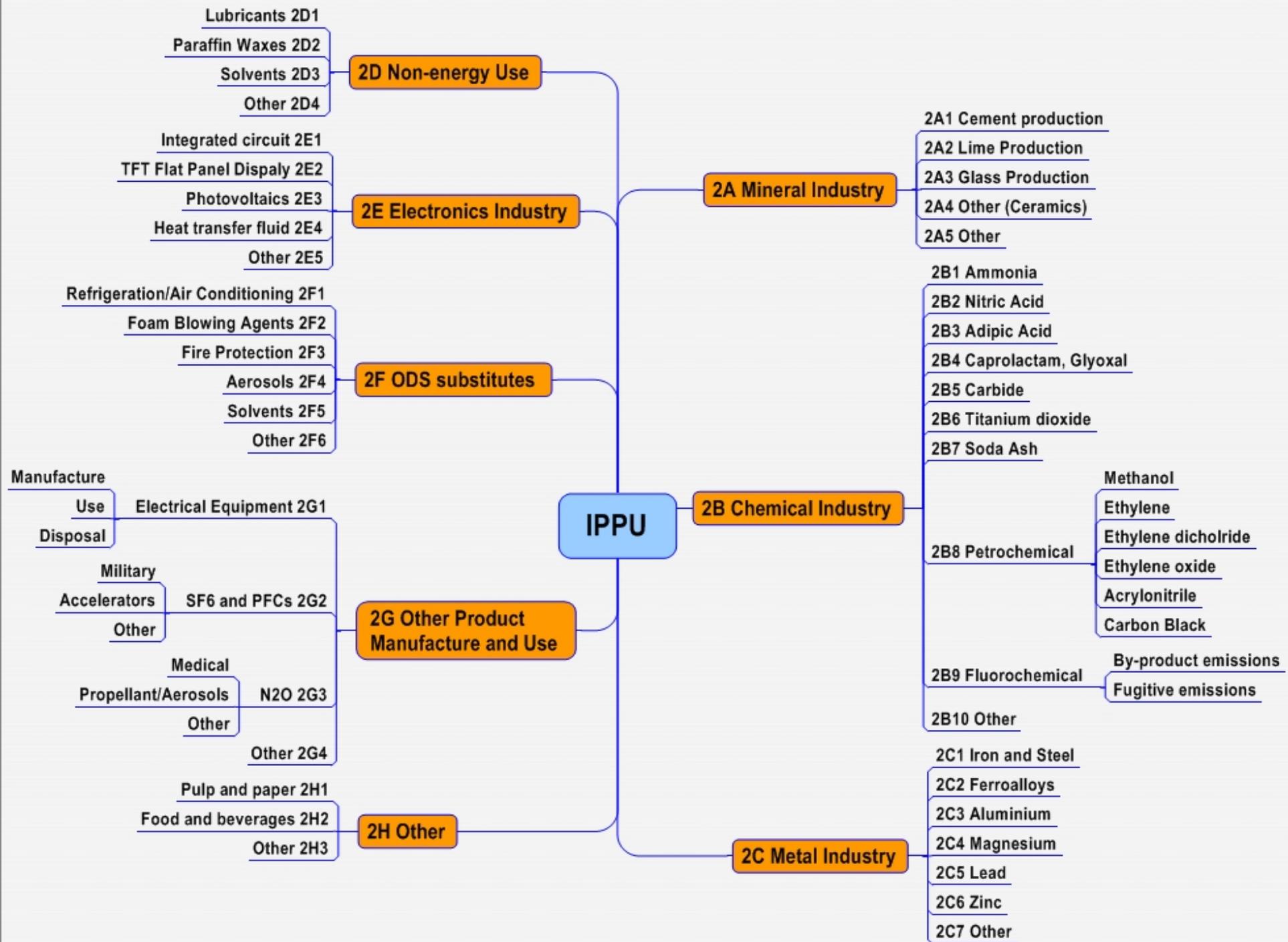
- Addition or improvement of methods for CO₂ emissions from Carbon Dioxide Capture, Transport and Storage

Additional issues / comments / ideas

- More explicit information on:
 - ✓ Carbon-emissions (CO₂, CH₄, NMVOC) and oxidation fraction (#1-150)
 - ✓ bio- and fossil part of wastes in Waste incineration (*Waste and Energy*) (#1-002)
 - ✓ net-biofuels emissions (*Energy and AFOLU*) (#1-177)
- Update on:
 - ✓ non-Energy use of fuels (#1-116)
 - ✓ aviation emissions (#1-081)
- Address the following sources:
 - ✓ gas-to-liquid, coal-to-liquid technologies (#1-119)
 - ✓ gold mines – CH₄ emissions (#1-118)
 - ✓ carbonate use in desulfurization (*IPPU vs. Energy*) (#1-074)

Additional comments / issues / ideas

- “Real world” emissions measurement (#1-189)
- Oil & Gas - all emissions into one Sector (#1-058)
- Reference Approach for developing countries (#1-137)
- Tracking carbon through categories (#1-103)
- Use of the EU ETS data (#1-109)
- Use of international datasets (#1-114)
- Black carbon (#1-093)



IPPU Sector

□ 42 experts, 128 comments, 7 high priority issues

IPPU Sector Category List	Comments
2. Industrial Processes and Product Use	128
2.A Mineral Industry	12
2.B Chemical Industry	24
2.C Metal Industry	22
2.D Non-Energy Products from Fuels and Solvent Use	0
2.E Electronics Industry	25
2.F Product Uses as Substitutes for Ozone Depleting Substances	24
2.G Other Product Manufacture and Use	6
2.H Other	2
Other IPPU categories that do not fall within any categories above	1

High priority issues: 2A. Mineral Industry

- User-friendly clarification of the existing guidance is necessary to explain the emissive and non-emissive uses of carbonates:
 - *it is a constant issue during reviews that the guidance on how to estimate emissions from carbonate use is very vague. Typically there are so many diverse uses whereas some are emissive and some are non-emissive, but AD are usually difficult to obtain, while using a mass balance approach of input/production/export can lead to overestimates as some uses will be non-emissive*

TABLE 2.7
EMISSIVE AND NON-EMISSIVE USES OF CARBONATES

Where are Carbonates Consumed?	Is source emissive?	If yes, where should emissions be reported?
<i>Agricultural:</i>		
Agricultural limestone	Yes*	AFOLU: 3C2 Liming
Poultry grit and mineral food	No	
Other agricultural uses	No	
<i>Chemical and metallurgical:</i>		
Cement manufacture	Yes	IPPU: 2A1 Cement Production
Lime manufacture	Yes	IPPU: 2A2 Lime Production
Dead burning of dolomite	Yes	IPPU: 2A2 Lime Production, where deadburned; outside of lime industry under Other (2A4d).
Flux stone	Yes	IPPU: 2C Metal Industry, Industry where consumed; unless counted within Energy (for combustible off-gases sold off-site)
Chemical stone	Yes**	Source category where consumed
Glass manufacture	Yes	IPPU: 2A3 Glass Production
Sulphur oxide removal	Yes*	Source category where consumed
Fertilisers	Yes**	IPPU: 2B Chemical Industry
<i>Ceramics and mineral wool:</i>		
Ceramics	Yes	IPPU: Mineral Industry: 2A4a Ceramics
Mineral wools	Yes	IPPU: Mineral Industry: 2A3 Glass Production or 2A4d Other, depending on production process.
<i>Special:</i>		
Mine dusting or acid water treatment	Yes*	Source category where consumed
Asphalt fillers or extenders	No	
Whiting or whiting substitute	No	
Other fillers or extenders	No	
<i>Construction:</i>		
Use as a Fine or Coarse Aggregate	No	

2A. Mineral Industry

Emissive and non-emissive uses of carbonates

TABLE 2.7 (CONTINUATION)
EMISSIVE AND NON-EMISSIVE USES OF CARBONATES

Production	Is source emissive?	If yes, where should emissions be reported?
<i>Other miscellaneous uses:</i>		
Refractory stone	No	
Acid neutralization	Yes*	Source category where consumed
Chemicals	No	
Paper manufacture	No	
Abrasives	No	
Sugar refining	Yes	IPPU: Emissions from lime production at sugar mills should be reported under 2A2 Lime Production; all other emissions in 2A4 Other Process Uses of Carbonates. Removals should be reported under 2H2 Food and Beverages Industry.
<i>Others</i>	Yes*, No	Where Yes, IPPU: 2A4 Other Process Uses of Carbonates

* Emissions are by an acidification reaction.

** Emissions could be by calcination and/or acidification.

High priority issues: 2B. Chemical Industry

- Hydrogen production should be recognized as a category in the guidelines and guidance should be provided noting that hydrogen is produced in many cases to be used in the production of other chemicals

High priority issues: 2C. Metal Industry

- Iron and Steel Production (2.C.1). It is necessary to improve the guidance for Iron&Steel Production to address the complexity of GHG emissions sources. It is necessary to update and improve default EFs.
- Aluminum Production (2.C.3). Develop a method to estimate PFC emissions from that are not associated with anode effects
- Magnesium Production (2.C.4). SF₆ is currently being replaced by HFC-134a (and to small part by HFC-125) as a cover gas. The emission factors should be provided using new scientific research

High priority issues: 2E. Electronics Industry

- It is necessary to update default EFs reflecting a variety of GHGs used in Electronics Industry and changes in technologies

✓ 2006 IPCC Table 6.2 based on 75 datasets/engineering judgments.
USEPA Mandatory GHG Reporting Rule utilizes 1182 datasets

Electronics Industry Sector	Emission Factor (EF) (Mass per Unit Area of Substrate Processed)						
	CF ₄	C ₂ F ₆	CHF ₃	C ₃ F ₈	NF ₃	SF ₆	C ₆ F ₁₄
Semiconductors, kg/m ²	0.9	1.	0.04	0.05	0.04	0.2	NA
TFT-FPDs, g/m ²	0.5	NA	NA	NA	0.9	4.	NA
PV-cells ^a , g/m ²	5	0.2	NA	NA	NA	NA	NA
Heat Transfer Fluids ^b , kg/m ²	NA	NA	NA	NA	NA	NA	0.3

High priority issues: 2F. ODS Substitutes

- The range of estimates for charge, operation and end-of-life emissions is quite large. In view of the high uncertainty and the lack of uniformity in this sector, further refinement of the default EFs would be welcomed
 - ✓ *Update a list of refrigerants, blends, foam blowing agents, solvents, etc.*

Additional issues / comments / ideas

- More explicit information on:
 - ✓ Iron&Steel emissions (IPPU vs. Energy) (#2-007)
 - ✓ Lime and Dolomite use for Metal Production (#2-074)
 - ✓ Ammonia and Methanol emissions (#2-102)
- Update on:
 - ✓ HFC-22/HFC-23 emissions (#2-118)
 - ✓ countries' silicon and glass design production (#2-047)
 - ✓ PVs emissions (#2-098)
- Address the following sources:
 - ✓ N2O from semiconductor, liquid crystals, electronics (#2-075,101)
 - ✓ CO2 from methacrylic acid, acrylic acid, vinyl acetate (#2-082)
 - ✓ PFCs from rare earth elements extraction (#2-111)
 - ✓ NF3 emissions (#2-093,121)

Additional comments / issues / ideas

- Enhanced guidance for Brick Manufacture (#2-115)
- Stack tests, ambient measurements (#2-021,107)
- Information about mitigation technologies, F-gases abatement, CO2 capture (#2-068,094,126)
- ODS substitutes: shortage of peer-reviewed literature, possible use of other information sources, incl. countries' submissions (#2-011)
- New information sources:
 - ✓ the US Protocol for Cement Industry (#2-032)
 - ✓ the EU ETS (#2-116)
 - ✓ CDM projects (#2-054)



Thank you for your time and attention:)