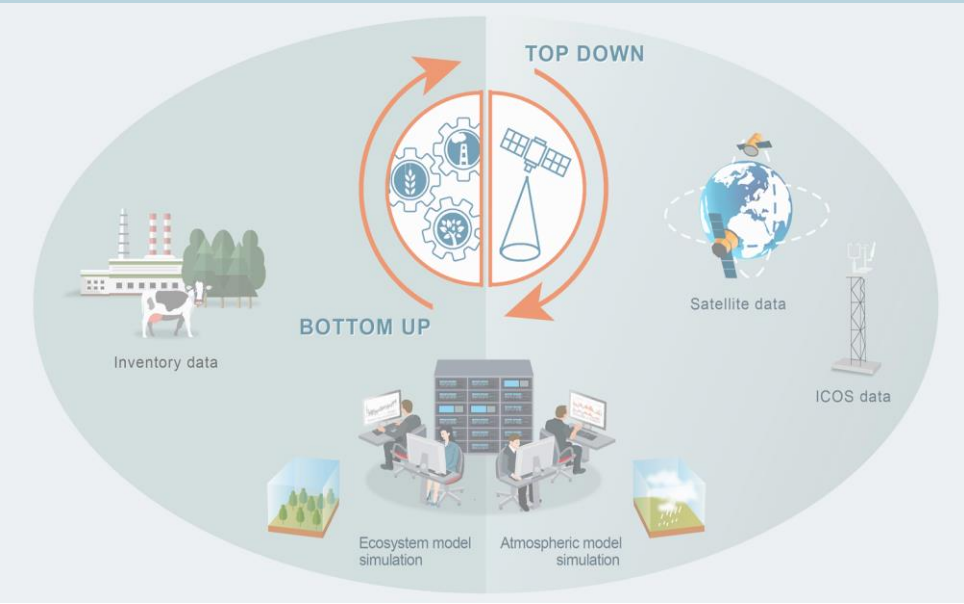
VERIFY General Assembly

Feedback from French National Inventory Agency (Citepa) for N2O and CH4 / Jean-Pierre CHANG

May 9th -11th , 2022



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FR-CITEPA FEEDBACK ON N2O AND CH4 / BACKGROUND

Interests of comparing TD vs BU approaches for N2O and CH4

-> N2O from agriculture and CH4 from solid waste : the 2 first key categories of French inventory (tier 2 KC analysis)

-> linked to very high uncertainties for N2O-agriculture soils & CH4-solid waste

-> total uncertainties for N2O 105% and for CH4 41%

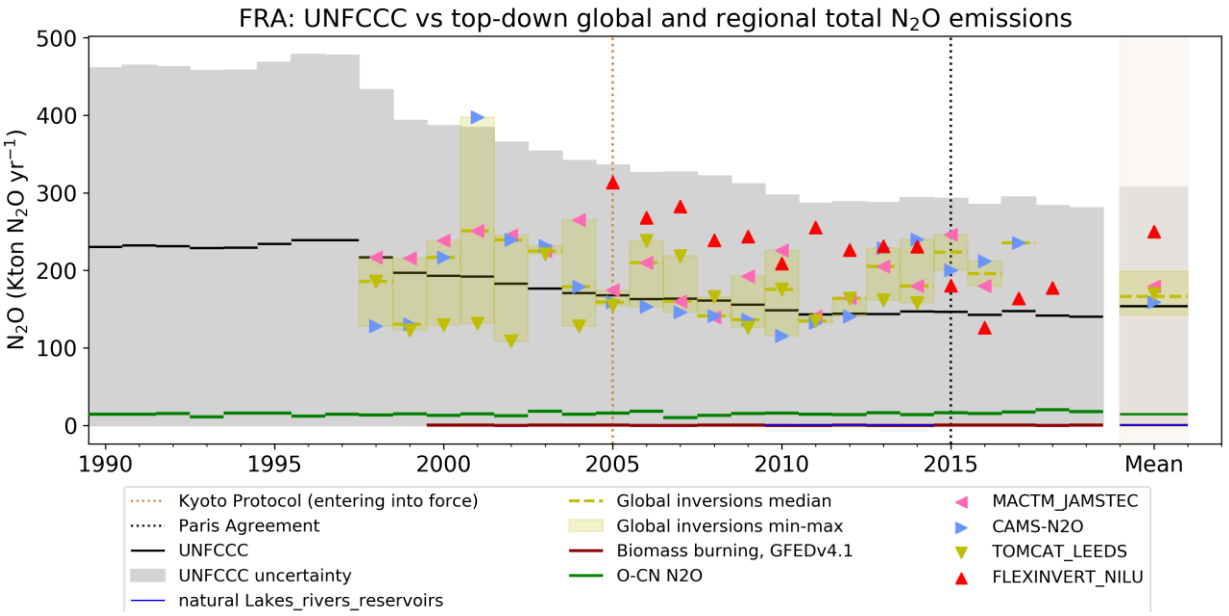
-> usefulness to compare and learn from observation-based flux estimates for N2O and CH4

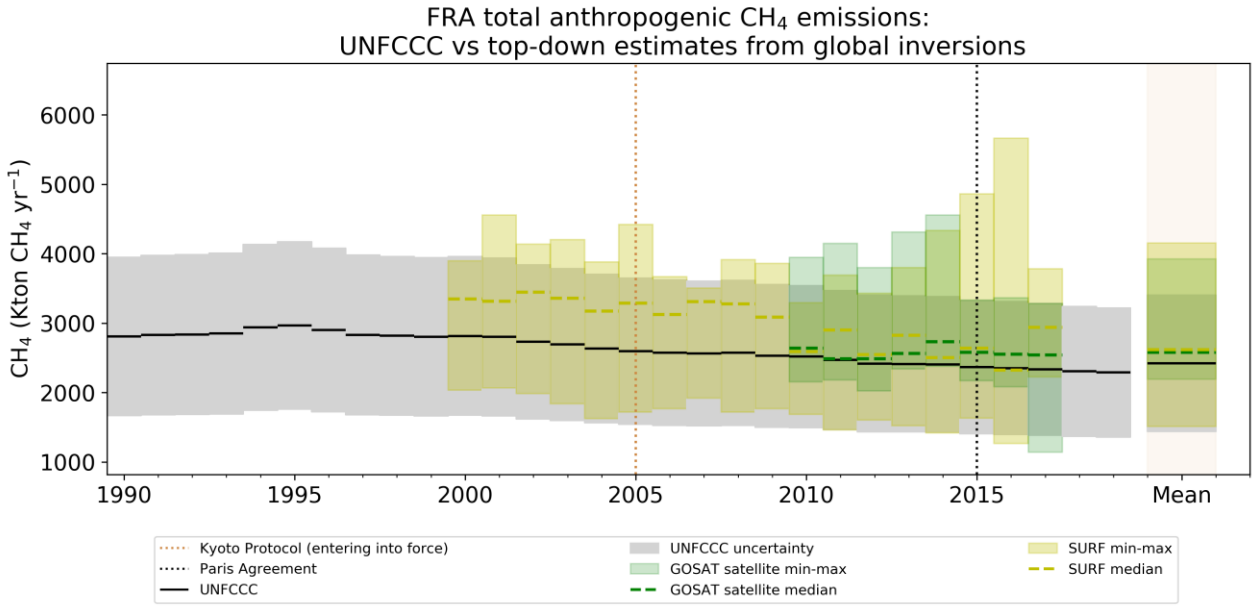
EVALUATION DES SOURCES CLES - ANALYSE EN NIVEAUX D'EMISSIONS TIER 2

source CITEPA / format CCNUCC - Mars 2022 — CITEPA-s_clés_tier2-GES.xlsx/KCA T2 niveau

	Catégorie de source du GIEC / combustible	Gaz	Emissions 2020 kt CO2e	Incertitude émissions (%)	Evaluation du niveau (%)	Total cumulatif	Catégorie clé Tier2 (à 90%)	Catégorie clé Tier1 (à 95%)
3Da	Direct N2O emissions from managed soils	N2O	23 998	146	23,74	23,7	1	5
5A	Solid Waste Disposal	CH4	11 965	176	14,26	38,0	2	10
3Db	Indirect N2O Emissions from managed soils	N2O	5 171	363	12,76	50,8	3	24
4B2	Land converted to Cropland	CO2	18 340	41	5,10	55,9	4	6
4B1	Cropland remaining Cropland	CO2	-6 832	100	4,64	60,5	5	20
3A	Enteric Fermentation	CH4	33 137	16	3,56	64,1	6	2
4A1	Forest Land remaining Forest Land	CO2	-24 144	18	2,95	67,0	7	4
4C2	Land converted to Grassland	CO2	-7 457	51	2,58	69,6	8	15
4A2	Land converted to Forest Land	CO2	-7 245	51	2,51	72,1	9	16
3B	Manure Management	N2O	2 350	150	2,39	74,5	10	36

N2O AND CH4 - TD VS BU VERIFY SYNTHETIC PLOTS





FR-CITEPA FEEDBACK ON N2O AND CH4 / MEAN FLUX

Mean data over a comparison period :

-> Quite comparable and consistent results (using the global median inversion) between TD and BU approaches:

-8% difference for N2O (2005-2014)

-6% for CH4 (2010-2016)

-> interesting QAQC support for the national inventory agencies

-> verification and confirmation of relatively good reliability of FR N2O & CH4 inventories in mean emissions level.

-> good overlap of uncertainties from both TD & BU approaches for N2O, and a partial overlap for CH4.

FR-CITEPA FEEDBACK ON N2O AND CH4 / INTERANNUAL VARIATION

Interannual variation - TD inverse models vs BU inventory:

-> Not comparable interannual variations.

-> Interannual variation: low in inventory versus large in inverse models.

-> IPCC equations do not include interannual meteorological sensitivity (but possible average climate regional types).

-> But such comparison is useful to reveal the cases where inventories do not reflet interannual fluctuations (e.g. from biogenic sources).

-> For N2O: good overlap of uncertainties (TD & BU), linked to large uncertainty in N2O inventory.

-> For CH4: only partial overlap of uncertainties (TD & BU). Inventory experts would expect less interannual variation.

FR-CITEPA FEEDBACK ON N2O AND CH4 / TREND

Trend comparison - TD inverse models vs BU inventory:

-> N2O inventory -> global decreasing trend (-13% from 2005 to 2014), VS different trends from inverse models (from -26% to +51%).

-> CH4 inventory -> global decreasing trend (-6.5% from 2010 to 2016), VS different trends from inverse models (decreases and increases).

-> So, no usefulness of TD trend results for verification of inventory trends

-> Need for further investigations on trend of TD approaches and further understanding of the differences between TD models.

FR-CITEPA FEEDBACK ON N2O AND CH4 / SUMMARY

TD inverse models vs BU inventory: summary and perspectives for N2O & CH4

-> An actual need for such comparisons/verifications taking into account large uncertainties of national inventories for N2O and CH4.

-> Quite comparable results with mean emission level: so usefulness of TD approaches for verification of inventories for mean level.

-> Strength of the TD approach to reveal actual interannual sensitive variations of emissions (e.g. due to meteorological conditions / biogenic emission sources).

-> Different trends according to different TD models: need for further investigations/developments of the TD approach for more consistent trend assessment, before using it for verification of inventory trends.

THANK YOU FOR ATTENTION

Jean-Pierre CHANG

jean-pierre.chang@citepa.org