

## Giacomo Grassi

### Candidate for the Bureau of the IPCC Task Force on National Greenhouse Gas Inventories (TFI)

**Nationality:** Italian, born 03.09.1970

**Position:** Scientific officer at the Joint Research Centre (JRC) of the European Commission.



### Motivation

The global climate policy is moving fast from pledges to implementation. At country level, national GHG inventories provide key information to climate policy makers and to assess compliance toward climate targets, like a car dashboard to the driver. On the other side, the IPCC scientific assessments provide what could be seen as the 'navigation system' for countries, indicating possible routes and destinations. Recent evidence I coordinated showed that the IPCC assessments need to connect better to national greenhouse (GHG) inventories, especially on the land use sector. I am strongly motivated to continue this work as part of the Bureau of the IPCC Task Force on National GHG Inventories (TFI).

If elected, I will use my extensive expertise in the science/policy interface to strengthen collaboration and consistency between the TFI Bureau and the IPCC Bureau (Working Groups 1-3). This will help bridging the IPCC high-quality scientific assessments with national GHG inventories, facilitating the translation of IPCC findings into country policies and the assessment of global progress towards climate neutrality. In addition, through my expertise in GHG inventories, I will support the IPCC TFI in spreading the implementation of internationally-agreed methodology and software for the calculation and reporting of high-quality national GHG emissions and removals.

### General profile

Degree in Agriculture Science (1994) and PhD in Forest Ecology (1999) from the University of Bologna.

Lead of the 'Land Use, Land-Use Change and Forestry' (LULUCF) group within the JRC's Directorate for Sustainable Resources, focusing on GHG emissions and removals from land use.

Main responsibilities include:

- At *EU level*: coordination of the LULUCF GHG inventory (2010-2022), scientific support to the design and implementation of EU legislation (LULUCF, bioenergy, forest strategy, etc.), and modelling of forest mitigation scenarios.
- At *global level*: analyses of the role of land use for climate change mitigation, harmonization of land use CO<sub>2</sub> fluxes by global models and national GHG inventories for the assessment of collective climate efforts under the Paris Agreement, and development of the LULUCF module of the EDGAR global emissions dataset.

Author in various IPCC reports, including:

- Coordinating Lead Author for the *"2013 Methodological Guidance under the Kyoto Protocol"*;
- Lead Author of the *"2019 Methodological Refinement of the 2006 Guidelines"*;
- Lead Author of the *"Special Report on Climate Change and Land"* (2019), Chapter 6 "Interlinkages between Desertification, Land Degradation, Food Security and GHG fluxes";

- Contributing Author in the “6<sup>th</sup> Assessment Report - WGIII” (2022), in Chapter 2 “Emissions Trends and Drivers”, Chapter 3 “Mitigation Pathways Compatible with Long-Term Goal” and Chapter 7 “Agriculture, Forestry and Other Land Uses”. First author in WGIII Cross-Chapter Box 6.

Author in the *Global Carbon Budget* in 2021 and 2022.

Lead author in “*UNEP Emission Gap Report 2022*” and “*State of Carbon Dioxide Removal 2023*”.

Familiar with the UNFCCC and IPCC processes.

UNFCCC experienced reviewer of national GHG inventories from developed and developing countries, including REDD+.

80 peer-reviewed papers (>5000 citations, h-index 35, from Scopus), including high-level journals.

## Main achievements

At *EU level*, my work has been instrumental in the scientific design of the “forest reference level” concept, used to assess forest mitigation in EU climate legislation 2018/841. In 2020, I received the JRC award for “Science support to policy” and the “Bologna international award for sustainability” for the “exceptional contribution to the design of EU policies on climate mitigation”.

At *global level*, I identified a previously unknown large gap in LULUCF estimates between the global models used in the *IPCC 6<sup>th</sup> Assessment Report* and the national GHG inventories. This gap - approximately 6 GtCO<sub>2</sub>/year, larger than the entire emissions of the USA – is big enough to hinder the assessment of collective climate progress under the Paris Agreement. My studies in high-level journals, through bridging leading IPCC climate modelers and the GHG inventory community, proposed a pragmatic approach to reconcile the gap, with relevant consequences for the remaining carbon budget. These findings are influencing the perception of anthropogenic land use fluxes in the global carbon modelling community, and are well-reflected in media (The Washington Post, the Economist), in IPCC Assessment Reports (Summary for Policy Makers of WGIII, Summary for Policy Makers of the IPCC Synthesis Report), and in high-level policy documents such as the UNFCCC synthesis for the Paris Agreement’s Global stocktake.

## Communication

Active communicator on climate change through public events and the social media, including:

- Tenthhs of invited talks at scientific conferences.
- Tenthhs of side events during UNFCCC climate conferences.
- Articles in ‘Carbon Brief’: <https://www.carbonbrief.org/guest-post-forests-provide-quarter-paris-agreements-pledged-mitigation/>; <https://www.carbonbrief.org/guest-post-credible-tracking-of-land-use-emissions-under-the-paris-agreement/>; <https://www.carbonbrief.org/guest-post-a-rosetta-stone-for-bringing-land-mitigation-pathways-into-line/>.
- Several posts in the blog ‘Climalteranti’ (<https://www.climalteranti.it/info/giacomo-grassi/>)
- Twitter ([https://twitter.com/giac\\_grassi](https://twitter.com/giac_grassi)).
- Interviews/mentions in leading international media (Washington Post, Economist, Wired, BBC).
- Several interventions in national Radio, TV and newspapers (mostly in Italy).

## Publications in peer-reviewed journals in the last 5 years

1. **Grassi G.**, Schwingshackl C, Gasser T, Houghton R, Sitch S, Canadell J... Pongratz J.. (2023) Harmonising the land-use flux estimates of global models and national inventories for 2000–2020

Earth Syst. Sci. Data 15, 1093–1114, 2023

2. Schwingshackl C., ... **Grassi G.**, Canadell J.G., Friedlingstein P., Gasser T., Houghton R.A., Kurz W.A., Sitch S., Pongratz J. (2022) Differences in land-based mitigation estimates reconciled by separating natural and land-use CO<sub>2</sub> fluxes at the country level. *One Earth* 5 12, 1367-1376.
3. Friedlingstein P., ... **Grassi G.**, et al. (2022) Global Carbon Budget 2022. *Earth System Science Data* 14 11 4811-4900.
4. Ceccherini, G., Duveiller, G., **Grassi, G.**, ... Cescatti, A. (2022) Potentials and limitations of NFIs and remote sensing in the assessment of harvest rates: a reply to Breidenbach et al. *Annals of Forest Science* (79:31)
5. **Grassi G.**, ... F. Tubiello (2022) Carbon fluxes from land 2000–2020: bringing clarity on countries' reporting. *Earth Syst. Sci. Data* 14, 4643–4666, 2022
6. Mubareka ,S., Barredo J, Giuntoli J., **Grassi G**, Migliavacca M., Robert N. and Vizzarri M (2022) The role of scientists in EU forest-related policy in the Green Deal era *One Earth* 5, January 21, 2022
7. Pilli R., R Alkama, A Cescatti, WA Kurz, **G Grassi** (2022) The European forest Carbon budget under future climate conditions and current management practices *Biogeosciences Discussions*, 1-33
8. Deng Z, Ciais P.,... **Grassi G**... F. Chevallier (2022). Comparing national greenhouse gas budgets reported in UNFCCC inventories against atmospheric inversions (2033) *Earth Syst. Sci. Data*, 14, 1639–1675, 2022
9. Alkama, R., Forzieri, G., Duveiller, G., ... **Grassi G.**, Liang, S., Cescatti, A. (2022) Vegetation-based climate mitigation in a warmer and greener World. *Nature Communications*, 13(1), 606
10. Giuntoli, J., Barredo, J.I., Avitabile, V., **Grassi G.**... Agostini, A., Mubareka, S. (2022) The quest for sustainable forest bioenergy: win-win solutions for climate and biodiversity. *Renewable and Sustainable Energy Reviews*, 159.
11. Mubareka, S. .... **Grassi G.**... (2022) The role of scientists in EU forest-related policy in the Green Deal era. *One Earth*, <https://doi.org/10.1016/j.oneear.2021.12.013>
12. Friedlingstein P., ... **Grassi G.**, et al. (2022) Global Carbon Budget 2021. *Earth System Science Data* 14 4 1917-2005.
13. Roe, S., Streck, C., Beach, R., ... **Grassi G.**... Woolf, D., Lawrence, D. (2021) Land-based measures to mitigate climate change: Potential and feasibility by country *Global Change Biology*, 27(23), pp. 6025–6058
14. **Grassi, G.**, Stehfest, E., Rogelj, J., ...Tubiello, F.N., Popp, A. (2021) Critical adjustment of land mitigation pathways for assessing countries' climate progress. *Nature Climate Change*, 2021, 11(5), pp. 425–434
15. Roe, S., Streck, C., Beach, R., **Grassi, G.**,...Woolf, D., Lawrence, D. (2021). Land-based measures to mitigate climate change: Potential and feasibility by country *Global Change Biology*, 2021
16. Vizzarri, M., Pilli, R., Korosuo, A., ...Colditz, R.R., **Grassi, G.** (2021) Setting the forest reference levels in the European Union: overview and challenges *Carbon Balance and Management*, 2021, 16(1), 23
17. Calvin, K., Cowie, A., Berndes, G., **Grassi, G** ...Slade, R., Smith, P. (2021). Bioenergy for climate change mitigation: Scale and sustainability *GCB Bioenergy*, 2021, 13(9), pp. 1346–1371
18. Perugini, L., Pellis, G., **Grassi, G.**, ...Günther, D., Peylin, P. (2021) Emerging reporting and verification needs under the Paris Agreement: How can the research community effectively **contribute?** *Environmental Science and Policy*, 2021, 122, pp. 116–126

19. **Grassi, G.**, Cescatti, A., Ceccherini, G. (2021). JRC study on harvested forest area: Resolving key misunderstandings. *IForest*, 2021, 14(3), pp. 231–235
20. Ceccherini, G., Duveiller, G., **Grassi, G.**, ...Pilli, R., Cescatti, A. (2021) Reply to Wernick, I. K. et al.; Palahí, M. et al. *Nature*, 2021, 592(7856), pp. E18–E23
21. Tubiello, F.N., Conchedda, G., Wanner, N., ...Rossi, S., **Grassi, G.** (2021) Carbon emissions and removals from forests: New estimates, 1990-2020. *Earth System Science Data*, 2021, 13(4), pp. 1681–1691.
22. Petrescu, A.M.R., McGrath, M.J., Andrew, R.M., **Grassi G.**, ...Brockmann, P., Dolman, A.J T (2021) The consolidated European synthesis of CO<sub>2</sub>emissions and removals for the European Union and United Kingdom: 1990-2018. *Earth System Science Data*, 2021, 13(5), pp. 2363–2406
23. McElwee, P., Calvin, K., Campbell, D., **Grassi G.**, ...Nampanzira, D., Smith, P. (2020) The impact of interventions in the global land and agri-food sectors on Nature's Contributions to People and the UN Sustainable Development Goals. *Global Change Biology*, 2020, 26(9), pp. 4691-4721
24. Ceccherini, G., Duveiller, G., **Grassi, G.**, ...Pilli, R., Cescatti, A. (2020) Abrupt increase in harvested forest area over Europe after 2015. *Nature*, 2020, 583(7814), pp. 72-77
25. Maria Roxana Petrescu, A., Peters, P.G., Janssens-Maenhout, G., **Grassi G.**,...Schelhaas, M.-J., Dolman, J.A. European anthropogenic AFOLU greenhouse gas emissions: A review and benchmark data. *Earth System Science Data*, 2020, 12(2), pp. 961-1001
26. Smith, P., Calvin, K., Nkem, J., **Grassi G.** ...Rounsevell, M., Arneth, A. (2020) Which practices co-deliver food security, climate change mitigation and adaptation, and combat land degradation and desertification? *Global Change Biology*, 2020, 26(3), pp. 1532-1575
27. Duveiller G., Caporaso L, Abad-Viñas R., Perugini L., **Grassi G.**, Arneth A., Cescatti A. (2020) Local biophysical effects of land use and land cover change: towards an assessment tool for policy makers. *Land Use Policy* 91 104382
28. Smith P., Calvin K., Nkem J., Campbell D., Cherubini F., **Grassi G.**, et al. (2019) Which practices co-deliver food security, climate change mitigation and adaptation, and combat land degradation and desertification? *Global Change Biology*. <https://doi.org/10.1111/gcb.14878>
29. **Grassi G.**, A. Cescatti, R. Matthews, G. Duveiller, A. Camia, S. Federici, J. House, N. de Noblet-Ducoudré, R. Pilli, M. Vizzarri (2019) On the realistic contribution of European forests to reach climate objectives. *Carbon Balance Manag.* Volume 14, Issue 1, 14.
30. **Grassi G.**, et al. (2018) Reconciling global-model estimates and country reporting of anthropogenic forest CO<sub>2</sub> sinks. *Nature Climate Change*. <https://doi.org/10.1038/s41558-018-0283-x>
31. **Grassi, G.**, Pilli, R., ... Kurz, W.A. (2018). Science-based approach for credible accounting of mitigation in managed forests. *Carbon Balance Manag.* 13 (8). <https://doi.org/10.1186/s13021-018-0096-2>.
32. **Grassi, G.**, Camia, A., Fiorese, G., .... Vizzarri, M. (2018). Wrong premises mislead the conclusions by Kallio et al. on forest reference levels in the EU. *Forest Policy and Econ.* 95. 10–12.
33. Pilli, R., Kull, S.J., Blujdea, V.N.B., **Grassi, G.** (2018) The Carbon Budget Model of the Canadian Forest Sector (CBM-CFS3): customization of the Archive Index Database for European Union countries. *Annals of Forest Science* 75(3),71.
34. Pilli, R., Vizzarri, M., Fiorese, G., **Grassi, G.** (2018) Il nuovo regolamento comunitario LULUCF: sfide e opportunità per il settore forestale italiano. *Forest@* 15: 87-93
35. **Grassi G.**, et al. (2018) The key role of forests in meeting climate targets requires science for credible mitigation. *Nature Climate Change*, doi:10.1038/nclimate3227.