

WP9 report

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ET-PP INFRA-DEV WP coordinators meeting

Monday 11 April 2022

Indico link: <https://indico.ifae.es/event/1383>

Bibliography

- **WP9 WikiPage:** https://wiki.et-gw.eu/INFRA_DEV/WP9/WebHome

You are here: ET - Einstein Telescope Wiki Pages > INFRA_DEV/WP9 Web > WebHome (24 Mar 2022, Narnaud)

INFRA-DEV WP9: Sustainable Development Strategy

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INFRA-DEV WP9

Coordinators

- Nicolas ARNAUD (CNRS/IN2P3 and EGO)
- Stavros KATSANEVAS (EGO)
- Maria MARSELLA (Roma La Sapienza University and INFN)

Documents

Reports from research centers

CERN

- [Environment report 2017-2018](#)
- [CERN ENVIRONMENT REPORT 2019-2020](#)

Preprints of interest

Sorted by date of publication

- [arXiv 2203.12389](#): Climate impacts of particle physics [Submitted to the Proceedings of the US Community Study on the Future of Particle Physics (Snowmass 2021)]
- [arXiv 2101.02049](#): [published in [Astroparticle Physics](#)] [CR](#): Estimating the carbon footprint of the GRAND Project, a multi-decade astrophysics experiment
- [bioRxiv 2021.01.14.426384](#) [CR](#): An open-source tool to assess the carbon footprint of research
- [arXiv 2201.08748](#): Estimate of the carbon footprint of astronomical research infrastructures + associated talk

Others

- 2017/12/08 OECD Strengthening the effectiveness and sustainability of international research infrastructures
- 2021/07 SKAO: Powering the world's largest radio telescopes sustainably

Links

- [ADEME](#) (l'Agence De l'Environnement et de la Maîtrise de l'Énergie): Resource centre for greenhouse gas accounting
- French Research Network ("GdR") [Labos 1point5](#)

Article of interest

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Article | [Published: 21 March 2022](#)

Estimate of the carbon footprint of astronomical research infrastructures

[Jürgen Knödseder](#), [Sylvie Brau-Nogué](#), [Mickael Coriat](#), [Philippe Garnier](#), [Annie Hughes](#), [Pierrick Martin](#) & [Luigi Tibaldo](#)

Nature Astronomy (2022) | [Cite this article](#)

(...) [W]e provid[e] an **estimate** of the **contribution of astronomical space missions and ground-based observatories using greenhouse gas emission factors that relates cost and payload mass to carbon footprint.** (...)

→ ~1 million tons CO₂e / year

- Humankind: ~50 billion tons CO₂e / year

→ All the projects in which the IRAP lab (Toulouse, France) is involved

- No GW facility

→ Extrapolation to worldwide footprint

- Not sure what this includes (or not)

→ Plan to invite lead author

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Labos 1point5

Collectif Recherches Vidéos Outils Ressources Actualités

Reducing the environmental footprint of our research activities

Labos 1point5 is an international, cross-disciplinary collective of academic researchers who share a common goal: to better understand and reduce the environmental impact of research, especially on the Earth's climate.

GES 1POINT5	THE COLLECTIVE	FOLLOW US
<p>Labos 1point5 launches a national scientific study on the carbon footprint of the French public research to provide food for thought on the levers of action to reduce its impact on the climate and the environment.</p> <p>Why use GES 1point5?</p> <p>The answer in 5 points.</p> <p>#GHG INVENTORIES #LABORATORIES #INITIATIVES</p> <p>623 395 89</p>	<p>Labos 1point5 is a collective of members of the academic world whose activities are organized within a research group and a think tank.</p> <p>To participate in the collective's activities, you can join the GDR and the think tank.</p> <p>Subscribers follow the collective's activities with the newsletter.</p> <p>#RG MEMBERS #THINK TANK MEMBERS #SUBSCRIBERS</p> <p>208 378 3244</p>	<p>Subscribe to our newsletter. This does not commit you to anything, but allows you to stay informed of the various activities of the collective.</p> <p>Email *</p> <input type="text"/> Email *

Send

- **Labos 1Point5**
 - “**Labs1Dot5**” in English
 - <https://labos1point5.org>

Labos 1Point5

- **GES 1point5**: compute **carbon footprint** and build **greenhouse gas inventory** of a lab
 - <https://labos1point5.org/ges-1point5>

Introduction

GES 1point5, developed by *Labos 1point5*, is a tool aiming at calculating the carbon footprint and building the greenhouse gas (GHG) inventory of your laboratory.

The goal of this tool is twofold:

- Carry out scientific studies relating to the carbon footprint of French public research. Our current research field is limited to France, including its overseas territories.
- Bring food for thought on the levers for action to reduce the impact of research activities on GHG emissions, at the national as well as at the local level of the laboratory.

Thank you for **carefully reading the guidelines** (methodology and help) before starting and contacting us.

How to cite *An open-source tool to assess the carbon footprint of research*. Jérôme Mariette, Odile Blanchard, Olivier Berné, Tamara Ben-Ari. bioRxiv 2021.01.14.426384; doi: <https://doi.org/10.1101/2021.01.14.426384> .

Why use *GES 1point5*?



- **Tool now available in English** for use outside France
 - **Country-specific emission factors** to be implemented case by case
- **Any country/lab interested in participating?**
 - **Besides EGO/Virgo(/LIGO)/ET project**

Labos 1 Point 5

- **Contributions** (still to materialize)
 - GES 1.5 tool
 - Working group on research infrastructures
 - ...

→ Attempt to **list the contributions to be included in the carbon footprint of a facility like EGO**

- Experimental halls
- Clean rooms
- Workshops
- Office rooms
- Meeting rooms
- Canteen
- Tunnels

- Vacuum pipes
- Nitrogen tanks
- Nitrogen delivery

- Commutes
- Onsite missions
- Travel missions
- Purchases and deliveries
- Onsite drives (in between buildings)

- Computing center
- Network
- Data transfer (both ways)
- Lasers
- Vacuum system

- Chemical products

- How much does the power consumption depend on the onsite activities?
 - Data taking, commissioning, maintenance, upgrades, (lock)down, etc. Travel certainly does.

- There are also all the construction phase(s) but they belong to the past => they should be dealt with separately.
- But they do matter for the overall footprint of the infrastructure.

- **Contributions/suggestions/comments welcome:**