

Towards Sustainability: Shaping the Future of DESY-FH

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The Climate Crisis is here.



Bush Fires, Australia, 2019/2020



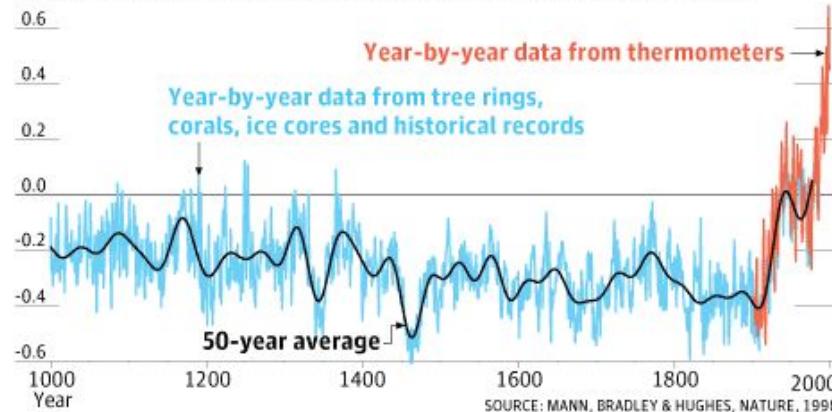
Hurricane Ida, USA, 2021



Ahrtal, Germany, 2021 – ...and the Paderborn tornado last week

Variations of the Earth's surface temperature

Northern hemisphere. Departures in temperature (C) from the 1961 to 1990 average



SOURCE: MANN, BRADLEY & HUGHES, NATURE, 1998

HEP Contributes to Global Warming.

- DESY consumes energy of ~150,000 households
- CERN consumes energy of 1.3 TWh per year: ~420,000 German households
- On top: “indirect” contributions
 - Production of parts for detectors, computing centers, ...
 - Detector cooling
 - Building and maintenance of other infrastructure, heating
 - Travel: Conferences, shifts, workshops, ...
 - ...

This needs to change!

We need to take a step back and think hard about how we're doing what we're doing.

After all, we're scientists, and human-made global warming is a scientific fact.

There are already several efforts in HEP...

- Stabstelle D6 (next talk)
- DESY switches to a renewable energy contract in 2023
- Starting awareness campaigns, e.g. Helmholtz Sustainability Summit
- Helmholtz Sustainability Challenge: DESY issued several projects
- Greening Hall 36
- Maybe more...?



...but we can do more!

If we want to tackle global warming, we must question everything!

- Make carbon footprint & reusability a design parameter
- Develop more energy efficient detectors & accelerators
- Reduce travelling – or use more sustainable transportation
- Introduce climate panels
- Introduce climate / CO₂ budgets – similar to monetary budgets
- Calculate & publish CO₂ consumption of publications
- Carbon footprints for computing jobs:
 - show CO₂ monitor
 - stricter rules on usage (grid retries, ...)
 - Prefer “green” grid sites
- CO₂ friendly coding: Profiling & (compiler) optimization, ...
 - faster code's nicer anyway!
- Check physics: Less systematics? More skimming? ...
- ...

But most importantly:

Make sustainability and the impact on global warming part of everyday work!

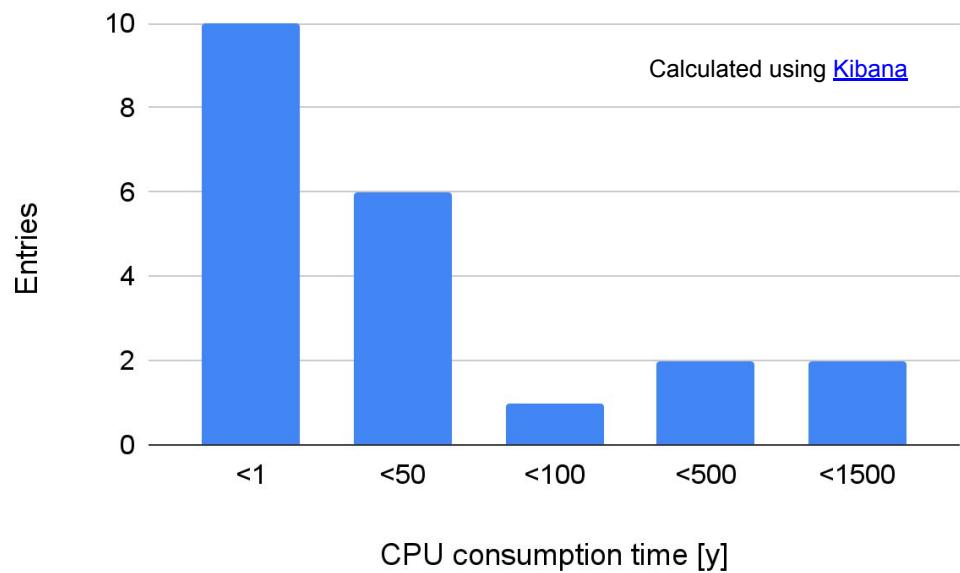
For example, there's a lot of CO₂ Reduction Potential in an ATLAS PhD.

Example of an ATLAS PhD student's grid consumption

Calculated using [Green Algorithms](#)

	CO2e [T]
<i>Computing - Grid</i>	38.94367
<i>Computing - HTCondor</i>	0.216
<i>Computing - Other</i>	0.12114
<i>Travelling - Train</i>	0.7433
<i>Travelling - Plane</i>	0.9
<i>Infrastructure (Office)</i>	
 <u>SUM</u>	<u>40.92411</u>

Also checked with more people:



Admittedly, this is an outlier...but still worrying!

And that's why we're here today: Presenting the DESY-FH Sustainability Forum.

A platform to discuss and share ideas and projects for sustainable HEP

- Talks on and discussions of different sustainability topics
 - Identification of unsustainable practices
 - Discussion of more sustainable solutions
 - Sharing of working, implemented solutions
 - Networking with other initiatives
- Establish innovative and support existing projects working towards a sustainable HEP

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A platform to discuss and share ideas and projects for sustainable HEP

- Monthly meeting: Last Monday of the month at 16.00h
- The next meeting is on June 27
 - Stay tuned! Write “*subscribe fh-forum-sustainability*” to sympa@desy.de
- Share your ideas and running projects with us here and/or through [this form!](#)
- If you’re interested in helping with the organization, let us know!

Make HEP more sustainable by identifying problematic practices and issues, kicking off discussions on solutions, and supporting projects!

**CLIMATE CHANGE
WILL NOT WAIT
FOR US TO FINISH
OUR RESEARCH.**

**LET'S TAKE
ACTION NOW!**

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Backup slides

Plan for the talk.

- Einführung Klimakrise – Done
- Was hat HEP damit zu tun?
 - Needs more examples!
- Wir sollten was verändern!
- Was wir schon machen
 - Can probably largely stay the same
 - Reread notes from talk with D6, maybe add Richard's forum and the sustainability conference which was at DESY last year
- Was das Forum hier soll
- Wie das Forum sein soll
- Aufforderungsslide: PhD → Papers/Research? – Done

Der Plan.

Hello, wir sind PhD Studis und wir machen uns struktuiert Gedanken über Klima. Schaut mal, Ben hat seeeeehr viel CO₂ verbraucht und hätte das nie herausbekommen, wenn er nicht explizit nachgeschaut hätte. Wir sollten das vereinfachen und uns grundsätzlich mehr Gedanken machen. Denn auch wir tragen (offenbar) dazu bei.

Hier sind ein paar Ideen, mehr Vorschläge sind willkommen!

Auswertung unseres Surveys dazunehmen, also Durchschnittswerte der CPU Hours bzw Verteilungen (letzteres fände ich besser)

in den Ideen ein paar Handlungsvorschläge unterzubringen (Klimapanel etc.)