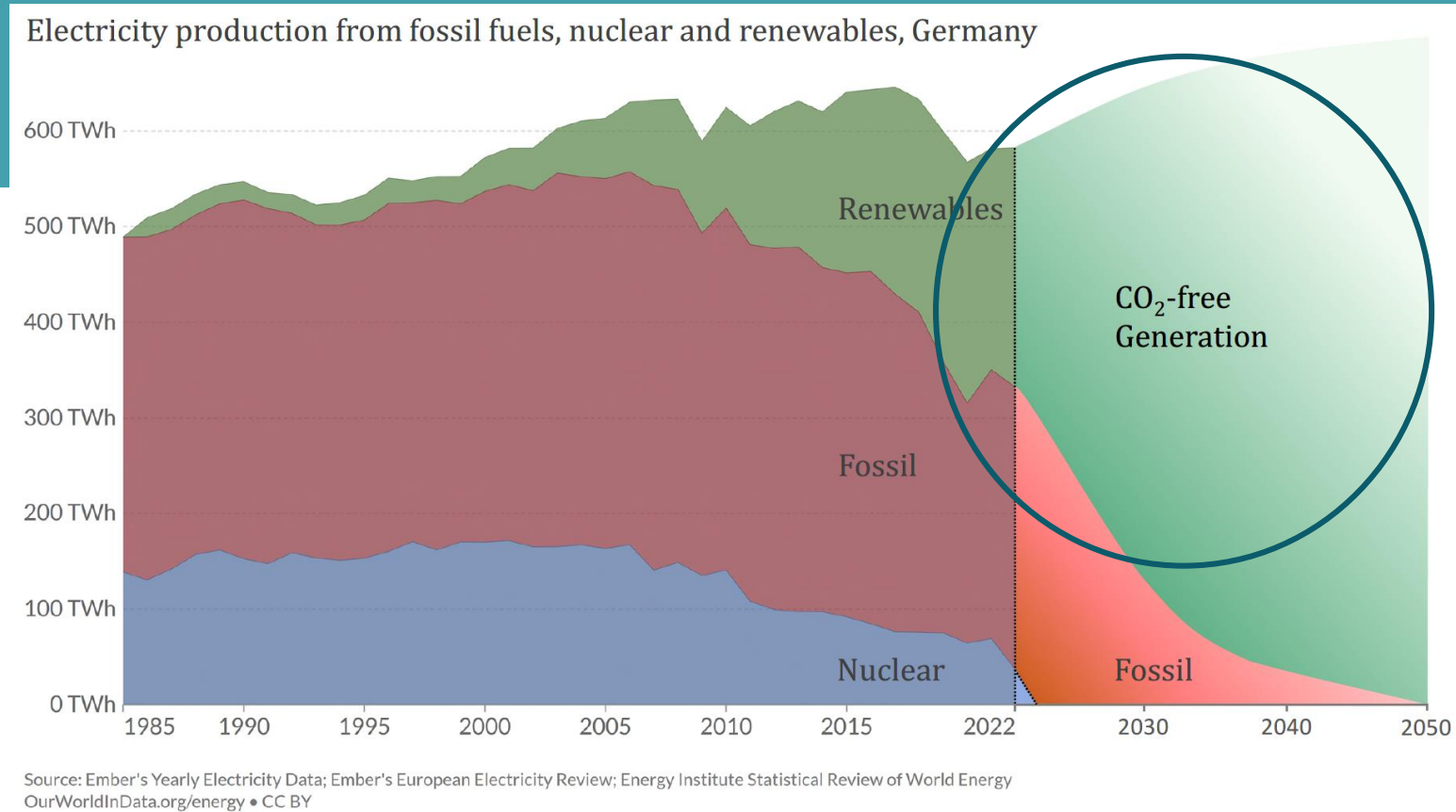


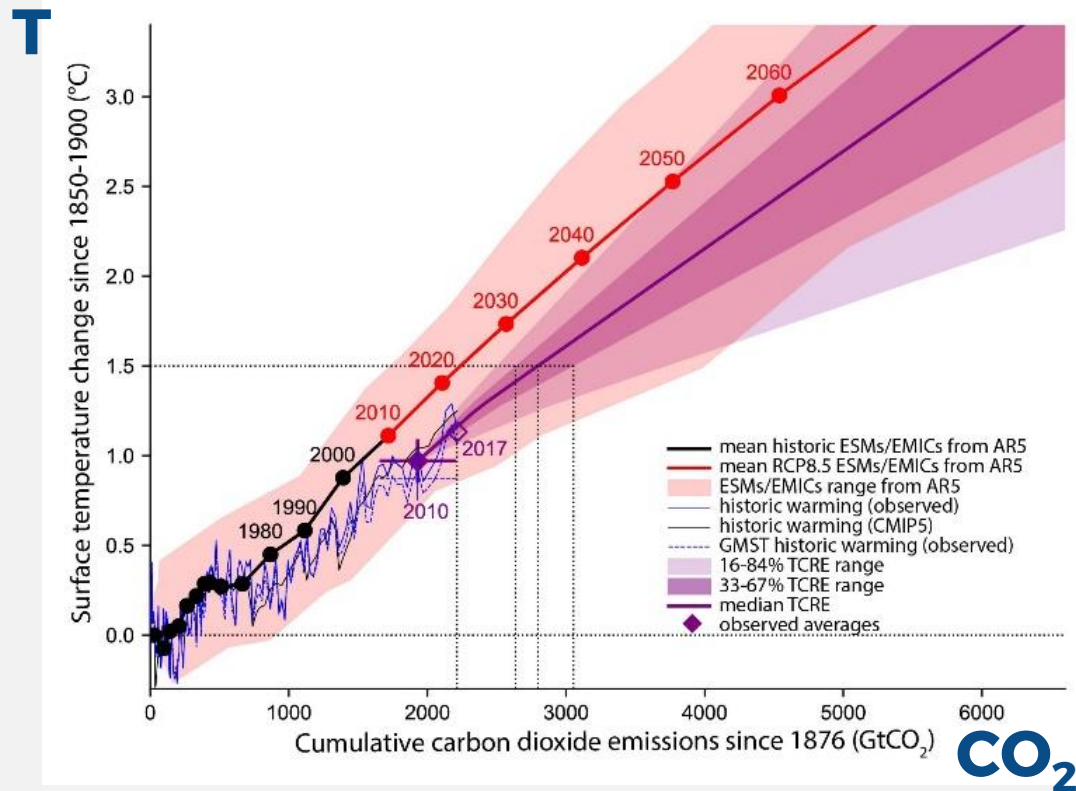
Fast and Efficient Python Programming School



Sustainability

Intergovernmental Panel on Climate Change

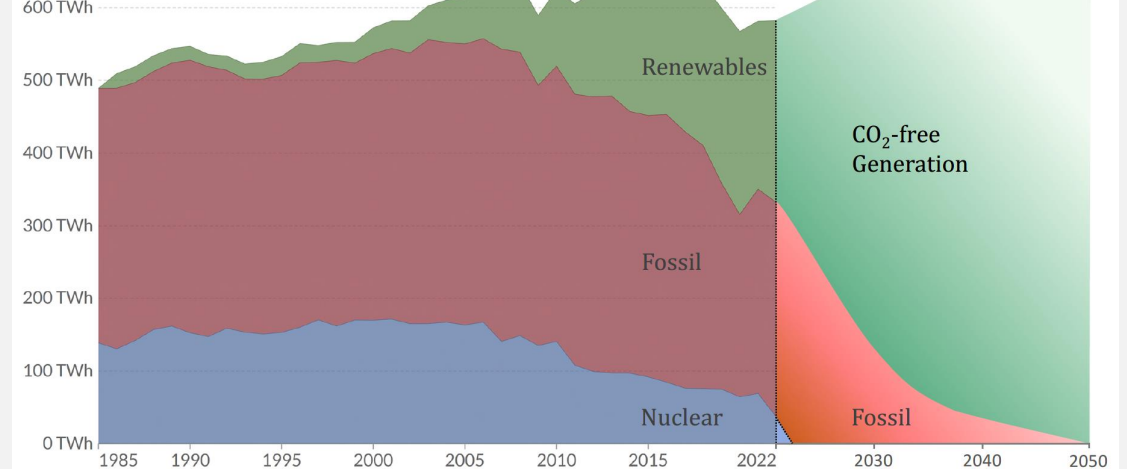
<https://www.ipcc.ch/sr15/chapter/chapter-2/2-2/2-2-2/2-2-2-1/figure-2-3>



Sustainability in ErUM-Data

Electricity production from fossil fuels, nuclear and renewables, Germany

May 2023, Meinerzhagen



Source: Ember's Yearly Electricity Data; Ember's European Electricity Review; Energy Institute Statistical Review of World Energy
OurWorldInData.org/energy • CC BY

Portfolio of Measures

Item	Call-to-action
Immediately or on short time scale with little effort these measures can be implemented:	
S1	Raise awareness of the climate challenge at all levels.
S2	Disseminate knowledge of measures to address the challenge.
S3	Monitor and report energy consumption at job level.
S4	Consider carbon footprint for all investments and project plans.
S5	Enhance awareness of the trade-off between research benefit and climate impact.
On a medium time scale of a few years the following measures can be realized:	
M1	Make data FAIR to promote reuse.
M2	Reduce and compress data having the anticipated scientific value of the retained information and the resource requirements in mind.
M3	Optimize the choice of storing intermediate results against re-calculating them.
M4	Optimize job orchestration and scheduling in workflows.
M5	Use workflow management to make processing FAIR.
M6	Make software FAIR and reliable by following good software development practices
M7	Design software for optimized energy consumption and provide tools to measure it.
M8	Optimize the use of resources (e.g., hardware, software, or efficient use of resources, but balance gains of research action against resource consumption of these developments.
M9	Monitor and report energy consumption at site and project level, provide information of the individual use per scientist/project/publication.
M10	Extend monitoring of resources beyond CO ₂ (water, material, etc.).

M7 Design software for optimized energy consumption

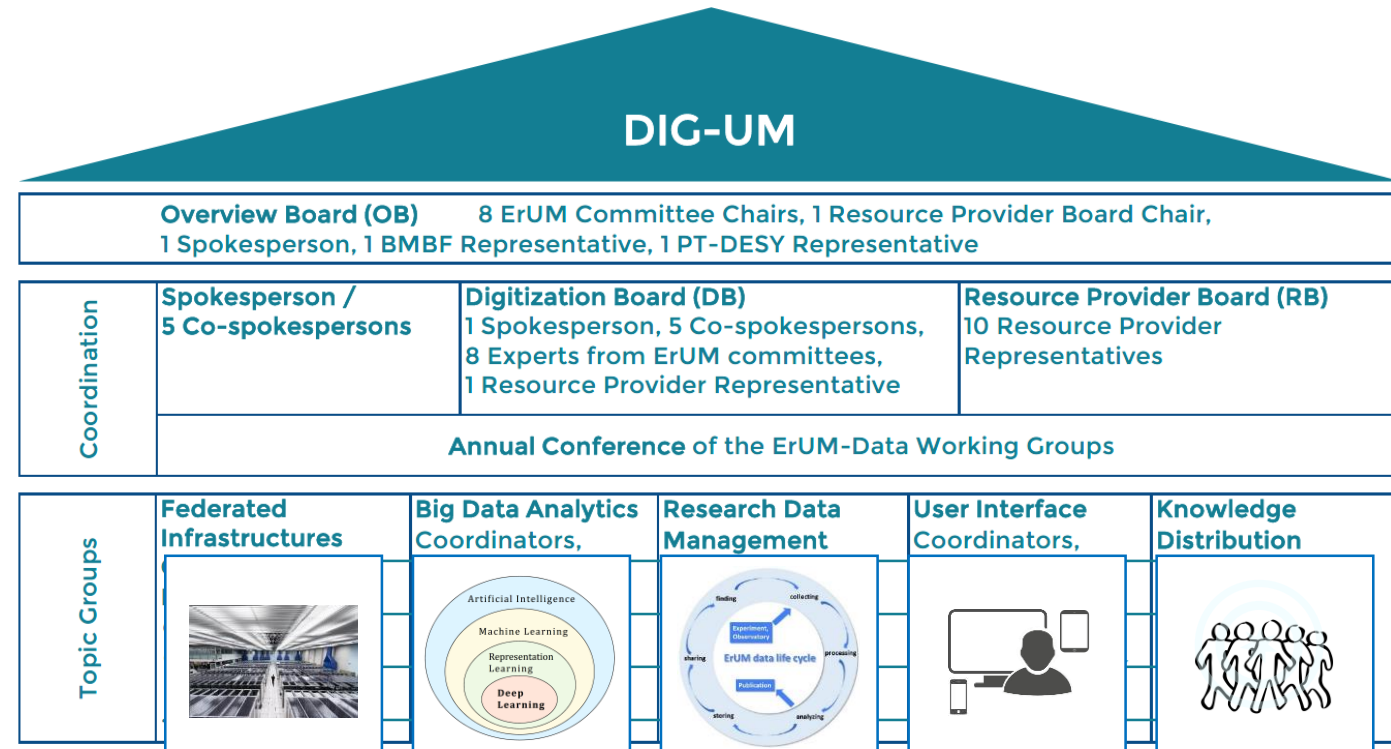
<https://arxiv.org/abs/2311.01169>

Promote digital transformation in physics research

8 research communities
with 20,000 scientists

Community

KAT	Astroparticle
KET	Particle
KfB	Accelerators
KFN	Research with Neutrons
KFS	Research with Synchrotron Radiation
KFSI	Research with nuclear Probes and Ions
KHuK	Hadrons and Nuclei
RDS	Astronomy



ErUM-Data-Hub: The Networking and Transfer Office

Digital
Competencies

Networking

Transfer &
Communication

Ministry science & education
funding program „ErUM-Data“

120 M€ / 2021-2030 for project funding



Network & Transfer Office
ErUM-Data-Hub
2,5M€ / 4 years

www.erumdatahub.de



SPONSORED BY THE



Federal Ministry
of Education
and Research



Networking

Education



Transfer

Hannover
Messe

