Christmas edition – PIK Alumni Newsletter, No. 5, 12/2021

Dear PIK Alumni,

It's almost the end of the year and everyone is getting ready for the Christmas break. We at PIK would like to wish you Happy Holidays and all the best for the New Year.

Apart from the fourth wave of the corona infection in Germany (and the return to working from home office for most PIK staff in December), there were two big events at the end of 2021: COP26 in Glasgow and the German election, resulting in the formation of a new "traffic-light" government. A number of members of PIK took part in live events in Glasgow (including Johan Rockstöm) or at online events in the context of the COP. At his presentation to staff at the PIK Townhall meeting in December, Johan Rockström briefly summed up developments.

Although COP26 didn't put the world on a 1.5° pathway (even if all countries' reduction pledges were fulfilled, it would still put us on a 1.8° or 1.9° C pathway), Johan summarised that there was progress: for the first time in COP history, all nations were debating the speed rather than the direction of change. The debate was about whether we can reach the targets fast enough, rather

than challenging the targets. Nature played an important role at COP for the first time. And the large amount of interaction between science and business was a good sign: Business sees the writing on the wall and knows it has to work with science.

Ottmar Edenhofer also reported at the PIK Townhall meeting on the new German coalition, its climate policy and the CO2 pricing debate. That's a debate he (and many at PIK) are heavily involved in: apart from contact with the now-Federal Chancellor Olaf Scholz (who visited PIK shortly before the German election), Ottmar Edenhofer has been speaking to numerous stakeholder groups on the theme of "Capital, climate, coalition: Exploring pathways to climate neutrality". You can read an analysis of the coalition´s climate policy plans (in German) by Ottmar Edenhofer and Axel Ockenfels in the FAZ here. Also on the theme of economic instruments, here is a recent article on emissions trading at EU level by Michael Pahle.

I hope you enjoy this newsletter.

Alison Schlums

Alumni Officer

Publication Highlights

Today's children will experience two to seven times more extremes than their grandparents

Today's children will be hit much harder by climate extremes than today's adults. In a paper in *Science*, an international team examined the age-dependent exposure to extreme events. It is the first study to focus on intergenerational inequity in this field.

In order to assess the age-dependent exposure to extreme events a collection of multi-model projections of climate change impacts from the ISIMIP project were used as a basis, as well as country-scale life-expectancy data, population data and temperature trajectories from the IPCC. They found that children born today will, on average, experience twice as many wildfires, between two and three times more droughts, almost three times more river floods and crop failures, and seven times more heatwaves compared to a person who's for instance 60 years old today. However, the analysis also shows hopeful results. Even though the exposure of young people to extreme events will be higher than today, this increase can be reduced by 24% by limiting global warming to 1.5°C than with unmitigated warming. Another reason to phase out the use of fossil fuels.

To continue reading click here.

Unprecedented rise of heat and rainfall extremes in observational data

A recent article in the journal *npj Climate and Atmospheric Science* presents the effects of the 0.25 °C warming over the past decade on heat and precipitation extremes during the same years. The results show an alarming increase in these extremes, despite the seemingly small amount of warming.

According to the analysis, 3-sigma heat extremes affect far more land than 10 years ago, and the even rarer and even more deviated-from-normal 4-sigma events show a 1000-fold increase compared to the 1951-1980 reference period. In addition, the frequency of precipitation extremes has also increased. Compared to a climate without global warming, the team concluded that 1 in 4

precipitation records can be attributed to climate change. The occurrence of such extremes has increased disproportionately, underscoring the importance of limiting global warming.

Another article from *PNAS* was devoted to the prediction of such extreme events. Using a new mathematical approach, the researchers were able to predict the onset of phenomena such as El Niño, monsoons or droughts much more accurately. Instead of only studying local interactions, for this model they look directly at the connectivity between different geographical locations, which can span continents or oceans. The analysis of these large-scale connectivity patterns provides critical new information for forecasting, which can potentially save thousands of lives and avoid billions in economic losses.

Read more about these articles here or here.

Pathways to Climate Neutrality 2045

The Kopernikus Project Ariadne investigates suitable policy instruments for a successful energy system transformation and its acceptance among citizens. In October, the project published a scenario report outlining transformation pathways towards the German climate targets - the first ever model comparison for climate neutrality 2045 in Germany! The report by more than 50 scientists, led by PIK, integrates ten different models and calculates six different scenarios.

The report clearly demonstrates that in order to achieve the extremely challenging climate protection targets for 2030 and 2045, massive investments, additional policy measures, infrastructure development in all sectors, and further research are necessary.

Electricity generation from wind and solar still needs to increase by 50% this decade to meet the 2030 coal phase-out. If this first milestone is not reached in time, the goal of climate neutrality in 2045 will become much less likely.

All scenario analyses show that the transition in the industry, buildings and transport sectors poses a particular challenge. By 2030, CO2-neutral processes must be usable and economically feasible for the industry. To achieve this, costs must be reduced and the relevant infrastructure expanded. In order to achieve the set targets in the building sector, the renovation rate must increase by 1.5-2% and there must be a consistent change in energy sources.

The largest discrepancies are in the transportation sector. Most of the changes are needed in private motorized transport and in road-based freight transport, as this is where most of the emissions occur. In addition to the electrification of passenger transport and expansion of the charging infrastructure, a change in mobility behaviour must be achieved in order to make the 2030 sector targets possible.

Other news

10 Must Knows from Biodiversity

The Leibniz Research Network Biodiversity took up its work at PIK with an interactive virtual conference in November that brought together all 18 Leibniz partners to discuss the network's future activities. Together they entered directly into their first joint project: a selection of 10 New Insights from Biodiversity Science (10NIBS) – inspired by Earth League, Future Earth and WCRP's 10 New Insights in Climate Science (10NICS) - which will be presented and discussed at various events on the road to the UN Biodiversity Conference in April/May 2022 and serve as a briefing paper for

German decision-makers, society, and media. Spokesperson Kirsten Thonicke and scientific coordinator Eva Rahner are additionally planning to bring together biodiversity-relevant science within PIK.

Ackerkonferenz

Both heads of Research Department 2 Climate Resilience were invited to share their vision at the recent hybrid event 'AckerKonferenz' which evolved around the key questions 'How do we want to live in 2030?' and 'How can we make this happen?' At the two-day conference organised by **Acker e.V**, scientists, social entrepreneurs and educator, discussed both 'live on stage' and online topics such as education, healthy nutrition and the path to a more sustainable society. Sabine Gabrysch gave a keynote on planetary health and the importance of understanding the connection between our own health and a healthy global ecosystem, while Hermann Lotze-Campen took part in a panel discussion on 'Joint action towards a sustainable transformation.'

Acker e.V. (formerly known as Ackerdemia e. V.) was founded in Potsdam by PIK Alumnus Dr. Christoph Schmitz, who completed his PhD at PIK and HU Berlin in 2012. Its focus is the GemüseAckademie which combines horticulture and school education in an innovative way through school gardens and kindergarten projects. Acker e.V. also runs various other programmes and has won a number of awards, for instance for the project “Zu gut für die Tonne”.

Podcast "Sustain Ability. The Potsdam Dialogues – Science for a safe Tomorrow"

In October, researchers Friederike Otto, from the Grantham Institute of Climate Change and the Environment at the Imperial College London, and Stefan Rahmstorf from PIK, were guests on the PIK podcast "Sustain Ability", talking about the science behind extreme weather events. The year 2021 was marked by weather extremes such as the severe flooding in western Germany, intense wildfires on the Mediterranean coast, and heat records on the west coast of North America. Against this background, the two researchers provide insights into their latest research, economic costs of extreme events and the art of communicating science.

The latest edition of “Sustain Ability” is about food and sustainability. It’s entitled “A plate full of sustainability: a chef and a scientist take a mouthful” and features agriculture expert Hermann Lotze-Campen and chef Megha Kohli. Sounds like something for Christmas! You can find all our podcasts here.

If you’re a podcast fan, you can find other podcasts featuring PIK scientists here: https://www.pik-potsdam.de/en/news/videos-podcasts/pik-scientists-featured-in-podcasts.

Annual PhD Day at PIK

This year’s PIK PhD Day was held online on September 6th. The event started with a keynote by Valérie Masson-Delmotte, discussing the recently released IPCC Working Group I’s report, and the challenges of communicating science to society. It was followed by a career panel consisting of PIK alumni (including Friederike Otto, see above) currently working in various scientific, public and private institutions. Reception from our doctoral researchers was very positive and we hope to continue with such exchange in the future. In the afternoon, we attended workshops about data visualization, career development, and mental health. Furthermore, the day was filled with quizzes about Telegrafenberg and PIK history and a social lunch break.

After not being able to meet for almost 1.5 years, we were happy to get together for a BBQ on Telegrafenberg as the social part of the PhD day. We would like to thank the Friends of PIK for their support of the PhD Day Quiz prizes as well as the BBQ.

Finally, encouraged by the great reception of the quiz winner prize, which were PIK logo adorned hoodies, we were able to offer them to all PIK staff. We are looking forward to seeing many PIKler in their hoodies on the Telegrafenberg Campus!

Vanessa Skiba on behalf of the PhD reps

Congratulations to …

… **the twelve PIK researchers** included in the influential ranking of "Highly Cited Researchers" published once a year by Clarivate Analytics. These researchers are among the top 1 per cent of the most scientifically influential authors worldwide. This result is also a confirmation of PIK's scientific standing as a transdisciplinary institute, as most of those named are assigned to the category "cross-field."

Two senior members of PIK:

- PIK Director Ottmar Edenhofer received the "Arthur Burckhardt Prize 2021" as an "outstanding economist as well as pioneer and expert in the field of CO2 pricing,"
- PIK Director Emeritus Hans Joachim Schellnhuber has been honoured by the French Legion of Honour for his outstanding achievements in the field of climate science, as well as the German Sustainability Award.

Three new professors:

- Linus Mattauch is the new Robert Bosch Junior Professor of Sustainable Use of Natural Resources at Technische Universität Berlin,
- Bernhard Schauberger was appointed as Professor of Agricultural Systems and Climate Change, University of Applied Sciences Weihenstephan-Triesdorf in Freising, and
- Niklas Boers has become Professor of Earth System Modelling at the Technical University of Munich.

.... **and one outstanding postdoc:**

- Björn Sörgel received the 2021 Postdoc Award of the State of Brandenburg in the category Humanities and Social Sciences from Brandenburg's Minister for Science, Research and Culture, Manja Schüle. The award recognized his publication 'Combining ambitious climate policies with efforts to eradicate poverty' in *Nature Communications*.

PIK's Alumni programme

Please keep in touch. Send an update to alumni@pik-potsdam.de if you have changed your job or otherwise want to update your details in our Alumni database. We'd also be very pleased to receive news about your recent publications, personal achievements, or research activities, which we may be able to use on the PIK Alumni website.

Best wishes to all!

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