

The Grantham Research Institute at 10

Analysis, engagement, leadership



THE LONDON SCHOOL
OF ECONOMICS AND
POLITICAL SCIENCE ■



Grantham
Research Institute
on Climate Change
and the Environment

Foreword



Welcome to the celebration of 10 years of the Grantham Research Institute on Climate Change and the Environment, here at the London School of Economics and Political Science.

LSE was founded with a mission of undertaking research 'for the betterment of society'. Over one hundred years later, the Grantham Research Institute stands as an embodiment of the very best of that mission, bringing together researchers and students from across the School in common pursuit of solutions to environmental challenges.

In particular, during a period when climate change has grown in international consciousness into one of the most pressing challenges of our age, the Institute has established a national and international reputation for research which has contributed to a global debate on how humanity can respond.

As the following pages demonstrate, the Institute's team has engaged on every front of this debate, from the very highest level of international policymaking to regular engagement with decision-makers across national governments, parliaments, international agencies and civil society. Their ongoing aim is to bring the benefits of their insights to bear on decisions being made now which

will enable people across the globe to meet the challenges of climate change, from transitioning to a new era of low-carbon development to building resilience in those already being affected by its impacts.

On behalf of the School, I extend our deep gratitude to the Grantham Foundation for the Protection of the Environment, which has been instrumental in providing support for establishing the Institute and for the contributions it has made, as detailed in these pages. The School also gratefully acknowledges the funding from the Economic and Social Research Council, which has enabled the work of the Centre for Climate Change Economics and Policy, jointly hosted by the Institute at LSE and the University of Leeds.

As the environmental challenges facing our world continue to grow in complexity, so too grows the need for policy-relevant research that provides pathways to solutions. I hope that in exploring the contribution the Grantham Research Institute has made over the last decade you too will recognise the value of supporting such active and relevant research.

Dame Minouche Shafik

Director, London School of Economics and Political Science

Introduction



Since its beginnings in 2008, the Grantham Research Institute has contributed to a transformation in the way action on climate change is understood around the world – evolving from narrow cost-benefit calculations to much broader and stronger analyses and insights into the relationship between the low-carbon transition and economic growth and development.

The Institute has been established on the principles of rigorous, robust and independent research and analysis, and engagement with the public, private and third sectors, to promote well informed decision-making about environmental problems, particularly climate change.

As the following pages show, the Institute has been engaged with decision-making on the global, regional and national scales. Our work has ranged from helping the international negotiators to achieve the 2015 Paris Agreement on climate change, to contributing evidence to the reform of the EU emissions trading system; and from identifying potential improvements in flood risk management for the UK, to working with partners in Sub-Saharan Africa to improve the use of climate information in making decisions about development and building resilience.

A global agenda has been created over the past few years, primarily through the Paris Agreement and the United Nations Sustainable Development Goals. The next 10 years will require acceleration

of action to match the scale and urgency of the challenges the world faces. Research and policy analysis now need to focus on how to create and exploit the opportunities that sustainable development and the low-carbon transition are generating, particularly for strong and inclusive growth across the global economy. Our understanding has developed a great deal over the past decade, but we still have much more to learn.

The low-carbon transition will require a deepening of international collaboration, building on the spirit of mutual understanding that has already fostered so much progress, with greater investment in innovation, technology development and infrastructure. Key to this is enlightened and credible policymaking.

The low-carbon transition offers the only realistic path towards sustainable and inclusive growth. Rich countries must support the world's poor countries to make the transition to low-carbon growth and to build their resilience to those impacts of climate change that cannot now be avoided.

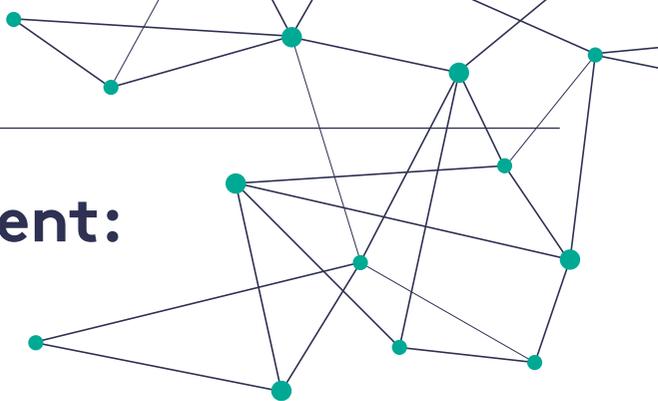
The Grantham Research Institute is a global institute with an international outlook, addressing the biggest environmental challenges facing the world. We seek to provide opportunities for researchers worldwide and from across many disciplines to work together to create new ideas and insights. As we look forward to the next 10 years, we hope to forge new partnerships and build further relationships with those who share our vision of a world in which climate change and other global environmental challenges are managed effectively to promote prosperity and wellbeing for all.

Professor Lord Nicholas Stern, Chair
Professor Dame Judith Rees, Vice-chair
Professor Sam Fankhauser, Director

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Supporting a global agreement: to Paris and beyond



Nicholas Stern (left) welcomes the signing of the Paris Agreement, with Al Gore and Ségolène Royal

Building a global consensus on collective climate change action has been a central aim of the international climate negotiations since the United Nations Framework Convention on Climate Change (UNFCCC) was agreed in 1992. Through its research and analysis the Grantham Research Institute has contributed to the negotiation process, helping to transform the narrative around climate action from one of burdens to be shouldered mainly by rich countries, towards one of shared opportunities, fostered by an atmosphere of collaborative internationalism.

Securing international agreement on climate change has been a long and difficult process, but one that the Institute has been dedicated to supporting. In the run-up to the Copenhagen climate change summit in 2009, the Institute's chair, Nicholas Stern, collaborated closely with Meles Zenawi, the Ethiopian Prime Minister who was leading the African Union,

and representatives of Hillary Clinton, then Secretary of State of the United States, on the contentious question of how much financial support rich countries should provide for developing nations' transition to low-carbon growth and increases in their resilience to climate change impacts. The United States eventually agreed that rich countries should provide US\$100 billion

"The Institute's research challenged the prevailing narrative that low-carbon growth would only entail significant costs that would need to be shouldered mainly by industrialised nations, and highlighted the major economic benefits that were being overlooked."

a year, from both public and private sources, by 2020 to support developing countries. This commitment was included in the Copenhagen Accord, and endorsed by all countries in the Cancún Agreements a year later.

Ahead of the Copenhagen summit, the Institute, with the United Nations Environment Programme, also contributed influential analysis of the

gap between the collective emissions reductions resulting from national plans and the projected emission pathways needed to limit global warming to no more than 2°C. The resultant report focused the attention of negotiators on the importance of increasing the ambition of emissions cuts by 2020.

Reframing the arguments for low-carbon growth

Despite intensive efforts, the Copenhagen summit failed to achieve a full consensus between all countries. According to Professor Stern, the UNFCCC principle of 'common but differentiated responsibility' had become a significant stumbling block in reaching meaningful international agreement. He challenged the prevailing narrative that low-carbon growth would only entail significant costs that would need to be shouldered mainly by industrialised nations, and highlighted the major economic benefits, especially for developing countries, that were being overlooked.

Governments and citizens needed to recognise the economic benefits of a low-carbon transition beyond the avoided damage from climate change impacts. Professor Stern and Institute colleagues worked with partners across the world to increase this understanding. A key milestone was the launch in 2014 of a landmark report, *Better Growth, Better Climate*,

overseen by the Global Commission on the Economy and Climate, co-chaired by former Mexican President Felipe Calderón and Professor Stern. It showed the additional benefits of action on climate change, including a reduction in death and illness from local air pollution; these have proved to be powerful arguments for accelerating the low-carbon transition.

Ensuring credible action and implementing the Paris Agreement

Principal research fellow Alina Averchenkova has been very active in dialogue with parliamentarians, including the Inter-Parliamentary Union, and other policymakers around the world especially on the importance of domestic governance frameworks and processes in ensuring the credibility of international commitments. At the Paris summit in 2015, Dr Averchenkova presented analysis of the credibility of countries' pledges, or 'nationally determined contributions', on mitigation and adaptation action. Researchers from the Institute also developed a framework for assessing the likelihood that the G20 nations would be able to implement their pledges. To aid national legislators and other policymakers, this work has been extended by Dr Averchenkova



Alina Averchenkova presents the 2015 Global Climate Legislation Study at the Paris summit (Photo: IISD/ENB enb.iisd.org/climate/cop21/enbots/8dec.html)

and colleagues as they develop tools for assessing how to make national regulatory frameworks consistent with contributions to the Paris Agreement. This work has been presented to the UNFCCC, European Commission, and to national parliaments and ministries.

The commitments on financial support for developing countries to make the transition to a low-carbon economy were extended beyond 2020 at the Paris summit, and Professor Stern worked with key countries to explore the role that the multilateral development banks, including the World Bank, could play in implementation. As the summit entered its final session, Professor Stern was given a front-row seat to witness the historic moment when countries approved the Paris Agreement.

Professor Stern notes the transformation in attitudes towards low-carbon growth between the summits in Copenhagen and Paris. He emphasises the change in the understanding of the role China could play in climate leadership (see p10), and the growing spirit of internationalism which led to the Agreement.

Supporting the implementation of the Paris Agreement is a core pillar of the Institute's research strategy. Professor Stern remains engaged with high-level policymakers, particularly on the issue of financing sustainable infrastructure. The Institute's governance and legislation team continue to focus on national climate governance systems (see p8-9), assessing the credibility of policies and the alignment between national legislative frameworks and countries' commitments under the Paris Agreement.

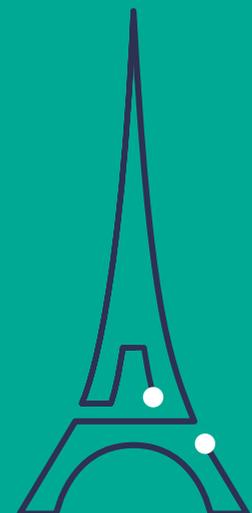
The Institute is also analysing the impacts of existing climate change legislation, and evaluating policymakers' experiences of passing and implementing climate laws and policies in various countries. There is a new focus on the political economy of ambition and drivers for ratcheting up the level of national contributions to the Paris Agreement. ●



"Under the visionary leadership of Nicholas Stern, over the past 10 years the Grantham Research Institute has been one of the most influential research powerhouses on global climate change. Their consistently compelling analyses of the economics of climate change have shifted the debate on decarbonisation from burden to opportunity and growth. It is this new understanding that will allow us to effectively address climate change."
Christiana Figueres, Executive Secretary, UNFCCC, 2010-16



"Nick Stern has been an inspiration to me, because as a leading economist he both understands and conveys the climate justice message. In addition, we both reference our grandchildren! The LSE and Grantham Research Institute database on climate change laws of the world [see p8] has been invaluable to my Foundation in assisting countries to respond to recommendations on climate change as part of the Universal Periodic Review of the Human Rights Council."
Mary Robinson, President, Mary Robinson Foundation – Climate Justice



Engaging with multilateral institutions

The support of multilateral institutions is crucial to the successful implementation of the Paris Agreement on climate change. The Institute has long been contributing expertise to decision-makers at the highest level in institutions that are increasingly turning their attention to actively building a sustainable and low-carbon future, including the World Bank, the European Bank for Reconstruction and Development (EBRD), and the Organisation for Economic Co-operation and Development (OECD).

The Institute's engagement with multilateral institutions is based on longstanding relationships. Both



"Under Nick Stern's vital leadership, the Grantham Research Institute has made a great contribution over

the past 10 years to shaping the global debate on climate change and the protection of the environment. The OECD is proud of our fruitful collaboration, which extends not only to research and analysis, but also to advocacy. The Institute has been an indispensable partner in our efforts to disseminate the work of the OECD in this area and communicate the policies needed to leave a better planet to future generations. We thank Nick and his team for the great partnership, which we look forward to continue enhancing in the years to come."

*Angel Gurría,
OECD Secretary-General*

Nicholas Stern and Sam Fankhauser held positions in the World Bank and the EBRD prior to joining the Institute. There is a regular exchange of staff between the Institute and the World Bank, which has provided Visiting Fellows to undertake post-graduate training, and with the OECD, which researchers and students have joined following their time at the Institute or on secondment.

Researchers from the Institute and international organisations have joined forces to explore specific policy options. For example, in 2017, along with Professor Joseph Stiglitz at Columbia University, Professor Stern was invited by the Carbon Pricing Leadership Coalition – an initiative supported by the World Bank – to chair a High-Level Commission on Carbon Prices. The objective was to explore how pricing carbon could drive investment in the low-carbon economy of the future and implementation of the Paris Agreement. The World Bank is now exploring the introduction of an internal carbon price, consistent with the Stern-Stiglitz recommendations, that it would use in the appraisal of all its projects.

Professor Fankhauser was part of the team that produced the World Bank's *World Development Report 2010: Development and Climate Change*, exploring how to enable countries worldwide to grow their economies and lift people out of poverty, while reducing emissions. Professor Fankhauser also co-edited the *Special Report on Climate Change: The Low Carbon Transition*, published by the EBRD in 2011. The report reviewed mitigation efforts in countries across central Europe and central Asia and the steps required to transition to low-carbon growth.

Continuing this engagement with the EBRD, Professor Fankhauser contributed to the Bank's *Transition Report 2017–18: Sustaining Growth*,

focusing on the growth trajectories of middle-income countries, and helped to draft a chapter of the report exploring green growth, with recommendations for middle-income countries to meet their commitments under the Paris Agreement while continuing to grow.

The economic consequences of moving to a low-carbon economy was also the theme of a two-year research programme sponsored by the South Korea-based intergovernmental organisation, the Global Green Growth Institute (GGGI). The project, *Green Growth and the New Industrial Revolution*, examined how environmental regulations can encourage economic growth; and how decision-makers should handle shifts in employment in sectors that might be adversely affected by green growth policies.

Work with the OECD has explored in particular the impact of the low-carbon transition on competitiveness and innovation.

In 2015 the Institute hosted the OECD's Secretary-General, Angel Gurría, for a lecture on the state of the climate debate in the run-up to the Paris summit. In 2016 researchers from the two organisations discussed the impact of environmental regulation on low-carbon innovation and trade in a joint workshop with OECD Chief Economist Catherine Mann.

What's next?

The Institute continues to work with international institutions on issues such as low-carbon growth and competitiveness. Antoine Dechezleprêtre, associate professorial research fellow, is currently seconded to the OECD. A project with the European Investment Bank is exploring finance for home energy efficiency in France, Germany and the UK. ●

Contributing to carbon market reform

While carbon trading in the European Union has helped member states to cut their greenhouse gas emissions, low carbon prices have caused concern that innovation and investment in clean energy technologies are being stifled. Now, new mechanisms are being developed to ensure carbon trading reduces emissions and stimulates businesses to shift more rapidly to a low-carbon economy. Work by the Grantham Research Institute has contributed to the direction of these reforms.

In 2005 the EU established its emissions trading system (ETS), which remains the world's largest 'cap-and-trade' scheme. While offering a mechanism that in theory enables large polluters to reduce their emissions in the most cost-effective way, the EU ETS suffered from substantial operational problems in its early phases. Significant among these was falling demand for emissions permits, leading to an imbalance in supply and demand to which the system could not adequately respond; in common with many cap-and-trade systems, the EU ETS was designed with a fixed cap on emissions and a rigid allocation programme of permits.

In recognition of concern around the sustained low permit prices this

decline in demand had created, and the corresponding danger this posed to achieving both long-term emissions reduction targets and the incentivisation of investment in low-carbon infrastructure, for some years the European Commission has been examining how best to reform the ETS. When the Commission held a consultation on reforms in 2013, including proposals for a Market Stability Reserve – whereby permits could be stored and released as required to reduce carbon price volatility – Luca Taschini and colleagues drew on their research into carbon trading systems worldwide to propose further improvements to the plans.

Further discussions with staff at the European Commission followed, centred on modelling by Institute researchers showing that the permanent removal of surplus permits within such a Reserve could further improve the intended aim of the mechanism to stabilise permit prices. Subsequently, in early 2017, the Council of the European Union decided to include a measure in the EU ETS reform proposals that considered the dynamic cancellation of permits held in any Stability Reserve Mechanism, now scheduled for introduction in 2019.

"There is a clear role for research on carbon markets to inform their

continued operation and design as they evolve," Dr Taschini says. "The work we are doing at the Institute is now examining the issues around linking carbon markets as we gradually move towards joined-up, international schemes. By researching potential operational challenges now, we aim to provide evidence for decision-makers to enhance the design of mechanisms to tackle emissions years into the future."

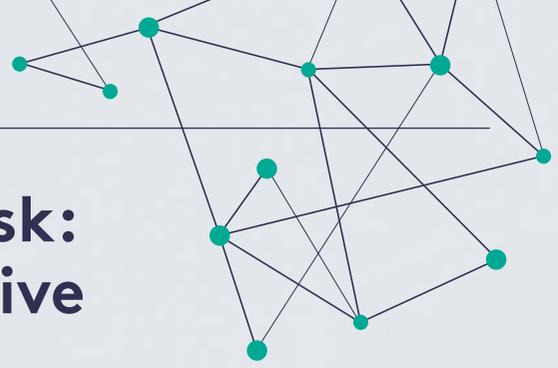
What's next?

Along with continued engagement with the European Commission on EU ETS reform, Dr Taschini is providing South Korean officials with information on addressing liquidity problems within the country's carbon trading scheme. He has also been asked to advise Chinese officials on designing a similar mechanism for an internal carbon trading system for China.

The linking of carbon markets is recognised as crucial for the cost-effective implementation of the Paris Agreement, yet little is known about what factors determine the economic gains from it. Dr Taschini and Dr Baran Doda are researching how to integrate carbon markets, proposing a general model to describe and quantify cost-savings associated with such linkages. ●



Exploring corporate climate risk: the Transition Pathway Initiative



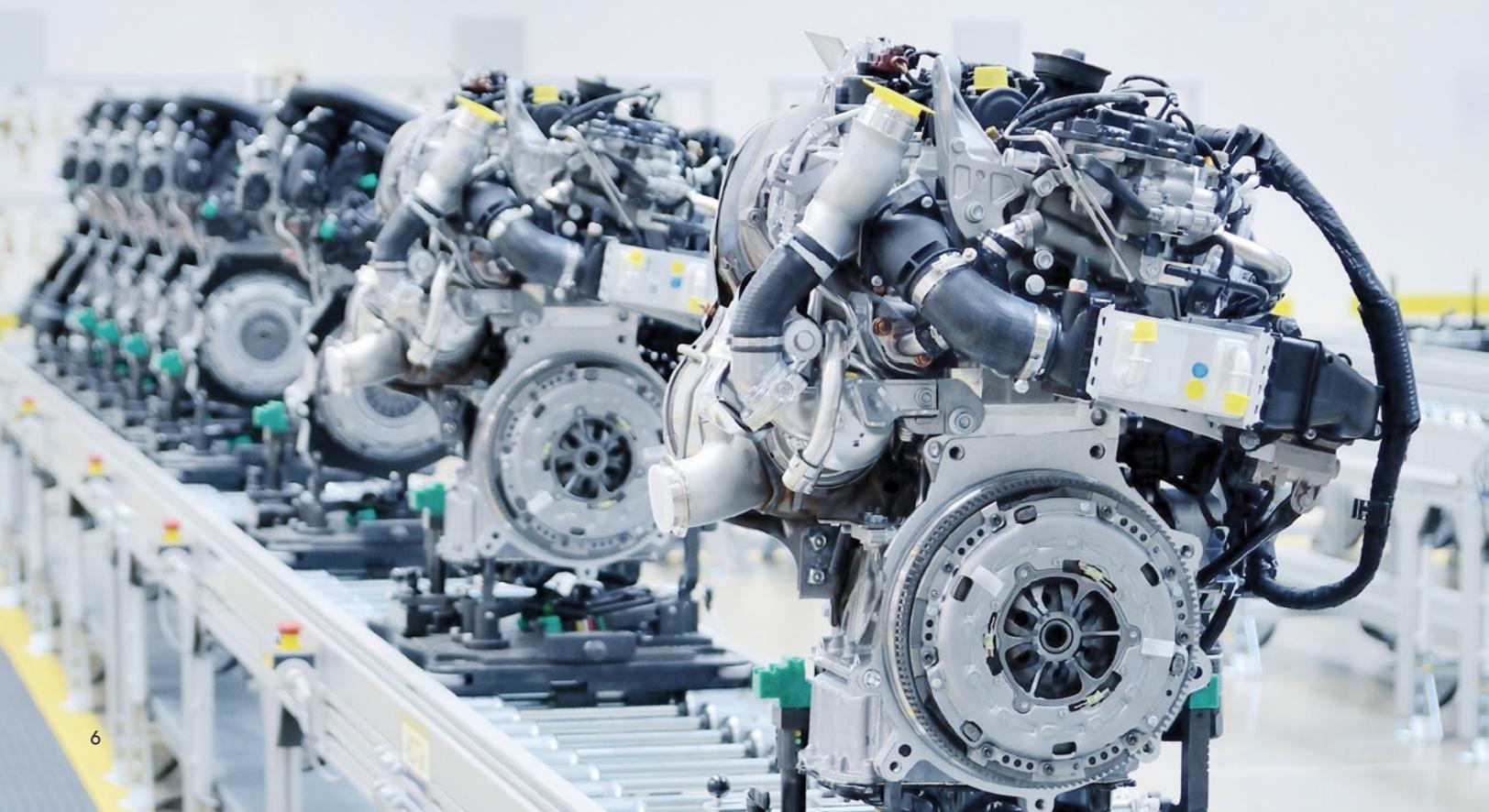
The world's economy is starting to transition to low-carbon growth, boosted by an increase in climate legislation over the last decade and the work of the G20's Taskforce on Climate-related Financial Disclosures (TCFD) in developing voluntary, consistent climate risk disclosure guidance. In tandem, a growing number of institutional investors have been considering the implications of climate change for their portfolios. It was in this context that the Transition Pathway Initiative (TPI) was born, with the Grantham Research Institute as the flagship academic partner, addressing previously limited access to information on exposure to climate risks for assets across different sectors.

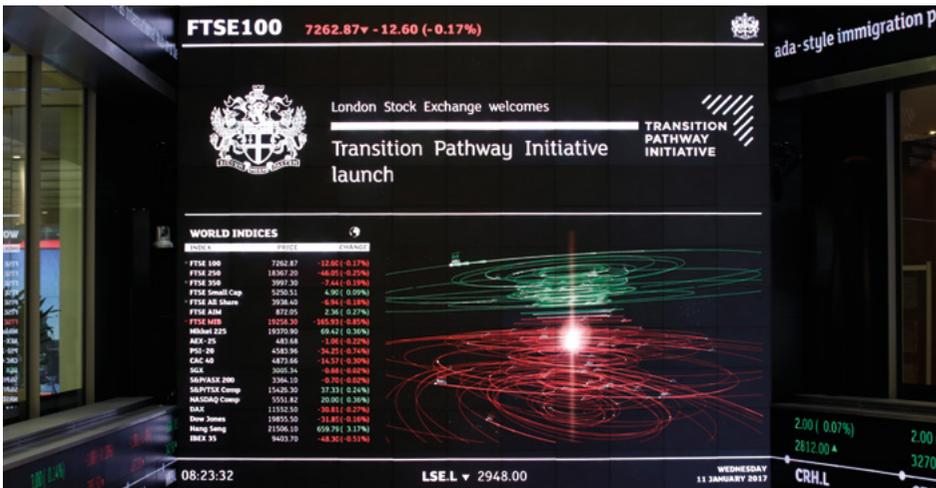
Established in January 2017 by the National Investing Bodies of the Church of England and the Environment Agency Pension Fund in the UK, the TPI is backed by institutional investors, pension funds and asset managers. It is evaluating what a transition to a low-carbon economy might look like across different sectors and for different companies, enabling asset owners to make informed judgements about how companies contributing to climate change are adapting to the low-carbon transition. It is also examining the extent to which companies are capitalising on

the new opportunities afforded by the vast scale of the capital investment required to make such a transition.

"There was a feeling that the investment community could benefit from the research we were already conducting at the Institute exploring climate risk," says Simon Dietz, who leads the Institute's engagement with the Initiative. "At the same time, we recognised that for, say, a pension fund trustee, the majority of the existing literature is too detailed. There was a need for a high-level overview across different sectors, indeed for individual

"Results to date from a range of sectors, from electricity utilities to the automotive industry, reveal stark variations in progress on addressing climate risks between companies."





The TPI was launched at the London Stock Exchange on 11 January 2017 with 13 leading international asset owners and five asset managers with over £2 trillion under management (Photo: London Stock Exchange)

companies, which we saw could aid engagement around climate risk issues.”

The team at the Institute devised a bespoke methodology, using data provided by FTSE Russell, and worked with asset owners to produce a free online tool, with new sectors being added continually. “What we are doing, in a very practical way, is analysing how comprehensively companies are reporting on climate risks, whether those risks are being strategically recognised and managed and, if they are, whether performance is at a level which matches international ambition in terms of emissions reductions,” says Professor Dietz. This includes evaluating performance against both national and international climate change pledges under the Paris Agreement.

Results to date from a range of sectors, from electricity utilities to the automotive industry, reveal stark variations in progress on addressing climate risks between companies.

As well as providing a tool for investors directly, the Initiative has engaged with the TCFD, which was initiated by Mark Carney and is chaired by Michael Bloomberg, and aims to develop voluntary, consistent risk disclosure guidance for use by companies. “Our work here at the Institute, contributing to the

Transition Pathway Initiative, brings this framework to life,” says Professor Dietz.

The number of supporting institutional investors and asset managers has doubled during the life of the Initiative. It has also gained official recognition from Principles for Responsible Investment – supported by the United Nations, this body is the leading proponent of responsible investment worldwide and it now provides the secretariat for the TPI.

“The Transition Pathway Initiative is a tipping point for the market,”

“Businesses should be able explain to investors how they plan to manage climate change risks, invest and innovate on the way to the zero-carbon economy of the future. With the launch of the Transition Pathway Initiative, asset owners from around the world are sending a strong signal that portfolios will align in the future with companies that are taking the transition to a low-carbon economy seriously.”
Emma Howard Boyd, chair, Environment Agency (UK)

says Adam Matthews, co-chair of the Initiative and head of engagement for the Church Commissioners and the Church of England Pensions Board. “There can be no doubt about the seriousness with which asset owners are taking account of these risks and it will be a key feature in the discussions we will be having with companies over the coming years.”

What’s next?

Forthcoming work from the TPI includes continuing to scale up coverage to cover over 200 companies, broadening the range of the online tool to include new sectors, updating and increasing the comprehensiveness of the methodology, and revamping the website and online tool to improve usability. ●

Use the TPI toolkit and explore the results at www.lse.ac.uk/GranthamInstitute/tpi/

Disclaimer: This article does not provide investment advice and nothing within should be construed as being personalised investment advice for your particular circumstances. This article does not take account of individual investment objectives or the financial position or specific needs of individual users. You must not rely on this article to make a financial or investment decision. Before making any financial or investment decisions, we recommend you consult a financial planner to take into account your personal investment objectives, financial situation and individual needs.



Simon Dietz addresses the TPI launch, with Emma Howard Boyd and Adam Matthews (Photo: London Stock Exchange)

Equipping parliamentarians worldwide with climate legislation and litigation knowledge

Creating a case for stronger legislation in support of climate action can be difficult for parliamentarians without the evidence to show how this will benefit their country. The Grantham Research Institute has been building up a unique knowledge resource to support their efforts.

Parliamentarians play several crucial roles in climate change processes: making laws, passing budgets and overseeing government action. Recognising that making the case for stronger climate action, especially through legislation, can be challenging, the Institute has been engaging this group and supporting their work since 2010. "Theirs were voices that were not yet clearly heard at the UNFCCC conferences so they needed to be better equipped with knowledge to influence within their own governments," says Michal Nachmany, whose work focuses on climate change legislation and governance.

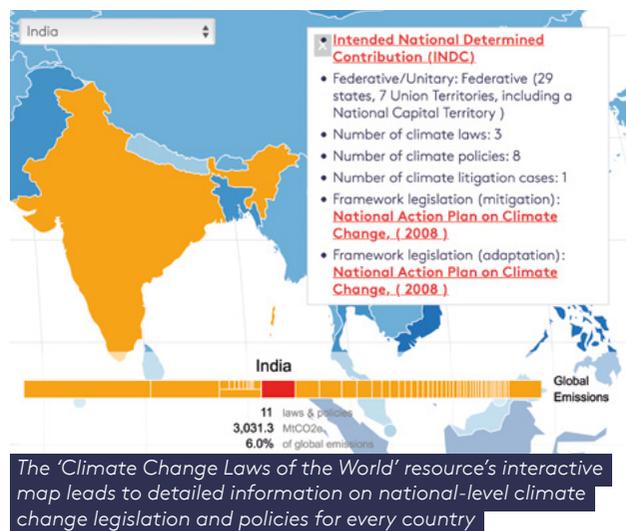
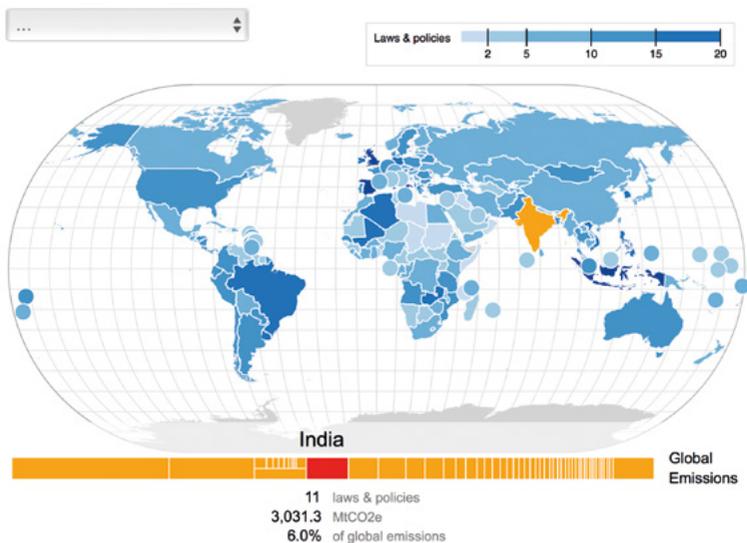
The Institute originally partnered with the Global Legislators Organisation, GLOBE International, to provide a platform for climate champions from different parliaments to meet and exchange knowledge to inform their own law-making. "That first meeting revealed that these parliamentarians required accurate information of what was

The Institute has continued to build up this one-of-a-kind knowledge resource, first with GLOBE as its partner, later with the Inter-Parliamentary Union, and since 2017 with the Sabin Center for Climate Change Law at Columbia Law School. Now a searchable online resource with global coverage, 'Climate Change Laws of the World'

"The scope of Climate Change Laws of the World is all the laws and policies from legislative and executive branches of government that are relevant to climate change mitigation and adaptation, and to transitions to a low-carbon economy."

happening in other countries, particularly those with similar circumstances or challenges," explains Dr Nachmany. So in 2011 the Institute published the first in a ground-breaking series of global climate change legislation studies: a compendium of laws, each summarised succinctly in English, avoiding legal jargon. They show what is being done, where, how and why.

is a tool for policymakers, academics, legal professionals, NGOs and journalists. Updated regularly, its scope is all the laws and policies – close to 1,500 to date – from legislative and executive branches of government that are relevant to climate change mitigation and adaptation, and to transitions to a low-carbon economy. In 2017 the web resource had nearly 11,000



The 'Climate Change Laws of the World' resource's interactive map leads to detailed information on national-level climate change legislation and policies for every country



Michal Nachmany at the GLOBE International Climate Legislation Summit 2014, where the Institute's fourth climate legislation study was launched (Photo: Jeff Leyshon)

visitors and the published annual update highlighting key trends was the Institute's most viewed and downloaded publication.

The resource reveals a wide range of options and solutions, helping parliamentarians to develop national responses to climate change. Indeed, China's National Center for Climate Change Strategy and International Cooperation credited it as directly informing the development of the country's draft climate change law: "The experience of other countries," wrote director general Li Junfeng in 2014, "has contributed greatly to our own legislation and policies."

By promoting transparency and access to information, the resource sends a strong signal to the international community. "Before the Paris Agreement, it was too easy for governments to disengage – why should one government act if they couldn't see that others were? Our work has been particularly effective in assuring parliamentarians that their country is not acting alone, thus strengthening their resolve and willingness to take action," says Dr Nachmany. UK Prime Minister David Cameron used the data to make this point in his address to

world leaders at the Paris summit in December 2015, in his support for a '2 degree deal', and UK legislators have repeatedly referred to the resource in parliamentary debates.

The accompanying collection of information on litigation features over 260 climate-related court cases from 25 countries, including those in which governments have been challenged

over insufficient ambition and those in which compensation has been sought from major emitters for climate-related injuries and costs. Increasingly, courts are being exposed to disputes involving action and inaction on climate change mitigation and adaptation. Dr Joana Setzer, who leads the Institute's research in this area, says, "The litigation database is a valuable resource for learning about specific cases or understanding trends in litigation."

What's next?

The governance and legislation team is further researching governance and institutional arrangement indicators, to assess the frameworks that countries use to design, implement and revisit their laws and policies. Additionally, more information is being analysed about targets in national laws and policies, to assess their consistency and alignment with countries' nationally determined contributions (the building blocks of the Paris Agreement) and the extent to which they allow ratcheting up of ambition. ●

Explore the data at www.lse.ac.uk/GranthamInstitute/legislation



"The Inter-Parliamentary Union is proud to have partnered with the Grantham Research Institute in producing *The Global Climate Legislation Study* in 2015 and *Global trends in climate change legislation and litigation* in 2017. These publications constitute a significant knowledge capital for parliaments: they are an important resource that MPs can consult at any time during their legislative work. Parliamentarians are a crucial element of any successful strategy for tackling climate change and are duty-bound to enact and amend laws, approve national budgets and hold governments to account. The aim of IPU's collaboration with the Grantham Research Institute is to produce high-quality and policy-relevant research to further support and empower parliamentarians working on climate change all over the world."

Martin Chungong, Secretary-General, Inter-Parliamentary Union

Contributing to the changing Chinese debate on climate change



The first 10 years of the Grantham Research Institute have coincided with a period that has seen a transformation in China's society, economy and environment, and the mainstreaming of climate action into its plans for economic growth. Nicholas Stern, who has been working in China since 1998, has contributed important analysis to the evidence base on which the Chinese government has drawn for its climate change policymaking and target-setting.

The outcome of the Copenhagen climate change summit in 2009 was viewed by many as a disappointment for not producing a comprehensive agreement signed by all countries, and the Chinese negotiators were unfairly blamed by some rich countries for that failure. However, the road to Copenhagen and the summit itself generated commitments to reduce emissions from China and the United States, the world's two largest greenhouse gas emitters, for the first time. China was one of five countries that successfully agreed the terms of the Copenhagen Accord, which became the blueprint for the Cancún

Agreements a year later, in turn an important step towards the landmark Paris Agreement. Since then, China has become a global leader on international climate change, and action has been embedded into its Five-Year Plans.

How did China's radical new approach to thinking about climate change come about in such a short time? Through rigorous empirical analysis of solid evidence, according to Professor Stern, and by seeking expert advice, China has understood that action on climate change is consistent with its goals for sustainable economic growth. As one of the few overseas experts regularly invited to contribute to the annual China Development Forum, Professor Stern has presented and discussed his work with senior Chinese representatives in Beijing. He has been very active in drawing the attention of the world to the speed and scale of climate action in China. A paper delivered to the Forum in 2015, which projected that China's annual emissions of carbon dioxide may have been close to peaking, received worldwide media coverage. Professor Stern has maintained good relationships with members of the Chinese government, including Xie

Zhenhua, China's chief negotiator at the United Nations climate change summits.

Mobilising finance for sustainable development

The launch of the New Development Bank (popularly known as the BRICS Bank) in 2015 was the culmination of a process that began from an idea originally conceived by Professor Stern with Professor Joseph Stiglitz of Columbia University in 2011. It has focused on mobilising finance for sustainable development and sustainable infrastructure, and especially on promoting renewable energy development. In China, the Bank is providing long-term loans to projects including offshore wind farms and rooftop solar power, which will contribute to the country's

commitment to reduce its reliance on coal. Professor Stern has pointed out that developing green infrastructure in Asia over the next 20 years is the key to managing the risks of climate change. He is a member of the international advisory panel of the Asia Infrastructure Investment Bank, launched in 2015 as part of the Belt and Road Initiative's regional infrastructure plan, and headquartered in Beijing.

as it has increased its understanding of the risks posed by the extent of its greenhouse gas emissions. This is apparent from the role it played in finalising the Paris Agreement and from its 12th and 13th Five-Year Plans, in which energy conservation, pollution control and renewable and alternative energy sources have been given high priority. Professor Stern has also been instrumental in showing the rest of the

"Professor Stern has been instrumental in showing the rest of the world how rapidly the picture is changing in China and the extent to which the country could act as a model for other emerging market and developing countries."

It is undeniable that the way that China approaches growth and development, both domestically and internationally, has changed dramatically over the last decade

world how rapidly the picture is changing in China, and the extent to which the country could act as a model for the economic growth of other emerging market and developing countries. ●



Building resilience to climate change impacts in developing countries

Climate science insights for Sub-Saharan Africa

The development and investment decisions being made now across sub-Saharan Africa will affect resilience to climate change impacts for years to come. The Grantham Research Institute is the lead academic partner in a major international collaboration involving universities and local organisations in several countries, working to enhance decision-making in the face of future climate impacts while strengthening local capacity to become more resilient.

This is the focus of UMFULA (Uncertainty reduction in models for understanding development applications – *umfula* means ‘river’ in Zulu), a research project and consortium of universities in the UK, Tanzania, Malawi, South Africa and Cameroon, led by Declan Conway at the Grantham Research Institute. This international team is producing climate science insights for more reliable information on how the climate

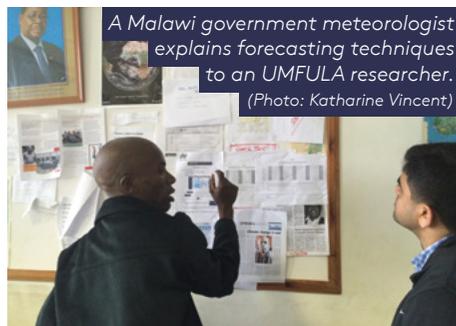
is changing in Malawi and Tanzania, including how extreme conditions may affect these countries in the future.

“We are working with decision-makers to produce tools that enable them to use the latest climate information to pursue development that is resilient to the effects of climate change,” says Professor Conway. “We are anticipating that this could be applied in other countries and regions, informing development strategies in a broad range of circumstances across Africa.”

The cross-institutional team worked with decision-makers in both countries, which are already affected by changing patterns of high-impact events such

as droughts and extreme rainfall, to explore their specific information needs on climate change. The researchers then produced data and analysis relevant for decisions being made on the development of new infrastructure, such as hydropower installations. For example, the project has considered how climate change will affect the Rufiji river basin, designated as the Southern Agricultural Growth Corridor of Tanzania, on which 80 per cent of the country’s hydropower depends. Balancing rapidly growing demand for water to support food and energy production is a critical challenge.

A key part of the project is to build long-term climate resilience expertise in the region, and so the consortium has sponsored Masters and PhD students at Lilongwe University of Agriculture & Natural Resources in Malawi and Sokoine University of Agriculture in Tanzania. UMFULA also aims to create strong relationships between researchers and decision-makers within affected countries and internationally, so that the benefits continue long after the project concludes. ●



Working with the private sector: Climate risks and opportunities in insurance

The Grantham Research Institute has worked with several insurance sector partners. In 2008, German reinsurance company Munich Re agreed to partner with LSE in a major research programme for five years, under the auspices of the Centre for Climate Change Economics and Policy, a joint venture between the Institute and the University of Leeds. The Munich Re programme explored how climate change would affect the insurance sector around the world.

The programme involved 29 staff members at LSE, and covered areas ranging from the impacts of climate change on extreme weather events to the economic impacts on emerging economies. It proved to be an agenda-setting programme, triggering many further projects, including the Institute’s current work exploring how climate insurance can improve resilience in developing countries. The programme also placed emphasis on direct engagement with policymakers,

Traditional cotton spinning or Mottude in Wendu Bosseabe village, Senegal, part of the PRISE research area. (Photo: Lancelot Ehode – IED Afrique/PRISE)



Building business resilience in semi-arid nations

Semi-arid regions are already experiencing changing rainfall patterns and periods of intense drought. The Institute's sustainable development group has been part of PRISE (Pathways to Resilience in Semi-arid Economies), the aim of which is to improve the resilience to climate change impacts of people living in semi-arid parts of Africa and South-Central Asia, including Senegal, Kenya, Tanzania, Pakistan and Kyrgyzstan.

The Institute's researchers who are contributing to PRISE are working with policymakers and decision-makers involved in shaping economic development in these semi-arid regions to promote climate-resilient economic development. PRISE does this by deepening understanding among stakeholders of the opportunities that climate change may bring, and also ways to build resilience to the challenges posed by its impacts.

The consortium is led by the Overseas Development Institute, and the team has worked alongside the Sustainable Development Policy Institute in Pakistan; Innovation, Environnement, Développement en Afrique in Senegal;

leading to follow-on projects such as a stocktake of risk transfer schemes in developing countries conducted by Swenja Surminski and Nicola Ranger. This database, intended to inform the UNFCCC's discussions about the use of financial instruments for addressing 'Loss and Damage', was subsequently used by the UK's Department for International Development and other aid agencies, and the UNFCCC has frequently consulted Dr Surminski on insurance and risk.

Several outputs from the Munich Re programme received special recognition. The paper by Dr Ranger and Dr Surminski on non-life insurance demand in the BRICS countries was shortlisted for the Lloyd's Risk Prize in 2014. The EAERE-award-winning paper 'Scientific ambiguity and climate policy' (Millner, Dietz and Heal) has had a significant impact on research into climate change economics. ●

the University of Ouagadougou in Burkina Faso; Kenya Markets Trust in Kenya; the Regional Environment Center for Central Asia in Tajikistan; and the Mountain Societies Research Institute at the University of Central Asia in Kyrgyzstan. They have explored potential pathways to enabling households and small businesses – which employ a significant proportion of people in these countries – to become more resilient in the face of climate risks.

The researchers have found businesses are already proactively using a range of strategies to ensure their continuity during extreme weather conditions. However, government support and specific adaptation assistance are essential to enhancing the ability of these firms to build their resilience.

As part of the broader PRISE consortium, the Institute's team is now engaging with national governments in partner countries, international civil society, multilateral development organisations, donor agencies, the international climate community and those involved more broadly in global economic development to present evidence on how they can support small businesses in semi-arid lands to become more resilient to climate change.

"While climate change is already impacting these businesses, there is recognition now that there should be an aspiration not only to cope, but to thrive even as conditions change," concludes Dr Florence Crick, one of the project's researchers. "We are contributing, in a specific and significant way, to making that a reality."

What's next?

The team will soon complete research on understanding the impacts of the major 2015 El Niño event on water resources and business activity in Botswana, Kenya and Zambia. A new project, ACACIA, is investigating the sustainability of development corridors established to promote areas of economic integration in East Africa, including the role of Chinese investment. ●

Advising on emissions reductions and climate risk management: mitigation and adaptation in the UK and beyond

Reducing greenhouse gas emissions in the UK

Through insights and analysis provided to the Government and the UK's expert independent advisory body, the Committee on Climate Change (CCC), the Grantham Research Institute has contributed to more informed policymaking about how to cut emissions.

Between 2008 and 2016 Sam Fankhauser was one of eight members of the CCC analysing research in order to advise on targets for the UK to reduce its emissions in line with the landmark 2008 Climate Change Act.

"I joined the Grantham Research Institute soon after becoming a member of the CCC. This meant I was able to contribute the most relevant and timely findings from the Institute's research," says Professor Fankhauser. For example, the Institute's work on low-carbon competitiveness informed an important Committee study published in 2013. The Institute's research suggested that some of the UK's energy-intensive sectors had a comparative advantage over key competitors. These findings went on to support the advice of the CCC to the Government on how to reduce the UK's carbon footprint and manage competitiveness risks.

"A significant recommendation we made as a committee was to elevate the UK's emissions reduction target from 60 to 80 per cent below 1990 levels, which in 2008 became the 2050 target in the Climate Change Act," says Professor Fankhauser. "The five carbon budgets we recommended define ambitious emission reduction paths into the 2030s, with clarity on the near-term necessary actions." So far the UK has achieved cuts that have surpassed the first and second carbon budget targets.

In explaining the scientific and international context for the fifth carbon budget, set in 2015, the CCC used details from the Institute's 2015 *Global Climate Legislation Study* (see p8). The CCC took evidence from the Institute's research on the widespread introduction of climate change legislation and economy-wide reduction targets around the world, and used it to show the credibility of developing policies to support low-carbon technology and markets.

Research carried out in 2017/18 by the Grantham Research Institute into the effectiveness of the CCC in its advisory role within the UK Climate Change Act framework shows that it is viewed as a source of independent, objective and trusted information, enabling an intelligent debate within and outside government. The Climate Change Act,

with the independent CCC playing its vital role, has also had an impact internationally. The Act is widely considered as one of the factors that enabled the UK to play a leadership role in the negotiations leading up to the Paris Agreement. This is a role that other countries value as they design legislation to cut emissions. ●



"The Grantham Research Institute has played a crucial role in the work of the Climate Change Committee.

The quality of its work and its intellectual capacity has helped our thinking in some of the most complex areas that we cover. Its name has always been a guarantee of rigour and objectivity. Of course, the Institute has brought together outstanding individuals but its fundamental strength has been its corporate discipline and common standards. Few Institutes have achieved such a reputation for rigour and capacity in a single decade of existence."

**Rt Hon. John Gummer,
Lord Deben, Chair, Committee
on Climate Change**

Adapting to climate change impacts in the UK and Europe

Climate change is already affecting businesses and communities in the UK, with a higher risk of heatwaves, heavy rainfall leading to river and surface water flooding, and coastal flooding from sea level rise. There is a clear need for planning and investment to adapt to these risks. The Grantham Research Institute has provided important analysis in this area, especially in relation to flood risk and insurance.

Two key processes the UK government uses for identifying priority risks and adapting to climate change impacts are the five-yearly Climate Change Risk Assessments and its strategy for addressing the identified risks and opportunities, the National Adaptation Programme (NAP). The Institute has strong expertise in finance, investment and insurance, and in the analytical and empirical examination of policies to deliver adaptation action; it identified priorities for action in a 'shadow' NAP in 2013, sparking frank exchanges with government, and made significant inputs to the second Climate Change Risk Assessment in 2017.

Between 2009 and 2015, Sam Fankhauser was a member of the CCC's Adaptation Sub-Committee, which was

asked by the Government to produce an evidence report to inform the second Climate Change Risk Assessment. Professor Fankhauser and colleagues contributed the methodology for deciding how to prioritise adaptation risks and opportunities.

Swenja Surminski, the Institute's programme leader for the 'climate risk, insurance and private sector' work stream, was chosen to be lead author of the business and industry chapter of the second Climate Change Risk Assessment. Her selection followed the publication of her extensive and influential research on flood risk insurance, especially her examination of the design of Flood Re, the UK government's flood reinsurance scheme.



Dr Surminski, with colleagues at the Institute and at the University of Oxford, extended the work under the EU's 'Enhance' project, using England as a case study. She says, "We were looking for new ideas for how to use

"As a result of Dr Surminski's recommendations, the Government revised the underpinning legislation for its flood reinsurance scheme, Flood Re, to take account of climate change impacts."

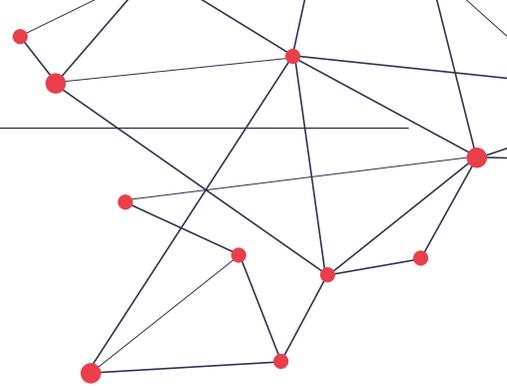
"We found that worsening flooding due to climate change is a barrier to provision of affordable insurance. Using insurance to incentivise effective adaptation and flood risk management instead of creating a false sense of security is crucial for ensuring that flood insurance is affordable and widely available," Dr Surminski explains. Her recommendations prompted the UK government to revise the underpinning legislation for Flood Re to take account of climate change impacts.

flood insurance, beyond paying for flood damages. We asked whether flood insurance could help to *prevent* flooding by addressing the underlying risk, for example by presenting incentives for homeowners and property developers to build more resilient homes, and by influencing government decisions." The team shared their findings and recommendations with insurers, policymakers and regulators in England and the rest of Europe.

Asked by the Bank of England to take up the role of visiting academic in 2015, Dr Surminski contributed to the Bank's first report on climate change impacts, which raised the question of who should pay to bridge the widening gap between the cost of the flood insurance the UK needs and the insurance that is currently in place. The report had a powerful impact. For example, Chinese officials engaged with Dr Surminski over questions of fairness, and twice she presented evidence to the Irish Parliament to inform their debates about flood insurance and adaptation, including refinement of Ireland's Flood Insurance Bill. ●



Communicating climate change risks: championing evidence and challenging misinformation



The Grantham Research Institute has actively promoted information to policymakers and the public about the risks of climate change, and has vigorously rebutted attacks from so-called 'sceptics' who oppose efforts to reduce greenhouse gas emissions.

Since its creation, the Institute has been very active in making evidence on climate change more accessible, particularly to policymakers and the public, and in combating inaccurate and misleading claims by climate change 'sceptics'. As a result of its actions, the Institute has gained a worldwide reputation as a champion of evidence-based policymaking on climate change.

Nicholas Stern, has been a prolific communicator through speeches, presentations and the media. He has been interviewed regularly by the international media over the



Jerry Brown, Governor of California, awards the Stephen H. Schneider award to Nicholas Stern

past 10 years, and has written many influential newspaper articles. For instance, he was invited to write an opinion article that led the front page of *The Guardian* in February 2014 to stress the urgent need for an international agreement on climate change. The many other newspapers Professor Stern has written for range from the *Miami Herald* to the *South China Morning Post*.

Professor Stern's influence as a communicator has won him several accolades including the Stephen H. Schneider Award for Outstanding Climate Science Communication in 2013, with the panel recognising that "few people have impacted the discussion of economics of carbon pollution more". Three years later the Political Studies Association awarded Professor Stern 'Best Use of Evidence by a Politician' for his "robust approach leading up to, during, and following the Paris Climate Change Conference in late 2015, acknowledged as being an important part of a significant global diplomatic achievement".

Other members of the Institute have also emphasised the importance of presenting evidence accurately. During the final preparation of the *Fifth Assessment Report* by the Intergovernmental Panel on Climate Change, the Institute's policy and communications director, Bob Ward,

Scientists challenge work of climate change dissenter

Channel 4 News, 4 April 2014

Lawson's climate-sceptic group hit by charity status row

BBC News, 16 July 2014

The headlines on these pages show a small sample of reporting on the Institute's work.

Nicholas Stern: cost of global warming 'is worse than I feared'

The Observer, 6 November 2016

Good chance Trump won't end up withdrawing from Paris

CNBC, 7 July 2017

Nicholas Stern: Spend billions on green investments now to reverse economic downturn and halt climate change

The Guardian, 11 February 2000

Greenhouse gases predicted to peak earlier than pledged

China Daily, 9 June 2015

British Press Watchdog Says Climate Change Article Was Faulty

The New York Times, 16 September 2017

British scientists to Theresa May: Urge Trump to support climate research

The Washington Post, 16 January 2017

World leaders must act faster on climate change

Financial Times, 29 September 2013

intervened as a reviewer to stop the inclusion of an erroneous conclusion that economic studies show moderate global warming to be beneficial overall.

The role of evidence is now more crucial than ever. As the world takes stock of progress towards the goals

to UK Prime Minister Theresa May in advance of her first meeting with President Trump. The letter, which was widely reported by media in the US and UK, drew attention to the dangers of political interference in climate research.

adjudication that the newspaper had breached editorial standards on accuracy.

The Institute has used its website and many other channels to explain the main issues around climate change in an accessible way. In 2012, the Institute worked in collaboration with *The Guardian* newspaper to produce 'the ultimate climate change FAQ', which aimed to 'amass the world's best layman-friendly online guide to all aspects of climate change'. The Institute's own website features expert commentaries on topical issues, including rebuttals of false claims about climate change by politicians and the media.

The Institute's efforts to promote informed public and policy discussions about effective management of climate change risks have paid off, according to Mr Ward. "We have been successful in debunking many false claims about climate change, but there is no room for complacency and we must continue to battle so that the public and policymakers have access to robust and reliable information." ●

"The Institute challenges attempts by some in the media to mislead the public."

of the Paris Agreement, policymakers are also under pressure from small but vocal groups of climate change 'sceptics'. "In the UK there is a very active campaign by lobbying organisations and by their allies in the media to mislead policymakers and the public about climate change," says Bob Ward. And in the United States, particularly since the election of President Trump, strong efforts have been made to undermine the evidence. In January 2017, Mr Ward helped to organise a letter from 100 members of the UK's climate research community, expressing solidarity with their counterparts in the United States,

The Institute supports accurate media reporting on climate change, including, for instance, through sessions at the UK and European conferences of science journalists. It also challenges attempts by some in the media to mislead the public about the risks of climate change. For example, a report in a *Mail on Sunday* article in February 2017 falsely alleged major misconduct during the preparation of a US research paper on the so-called 'hiatus' in global warming. Mr Ward made a complaint about the article to the UK's Independent Press Standards Organisation which eventually resulted in the publication of an official

World-class research, academic impact and events

The Grantham Research Institute has built up an international team of talented academic researchers from across multiple disciplines. The World Bank has described the Institute as having 'the largest and strongest group of environmental economists in the world'¹ and assessors from the Economic and Social Research Council have rated the research achievements of the ESRC Centre for Climate Change Economics and Policy (CCCEP), which is hosted by the Institute and the University of Leeds, as 'excellent'.

The Institute's events programme reflects the rigour and cross-disciplinary nature of its academic work and has attracted many inspiring, world-class speakers from different spheres to deliver keynote speeches.

These pages provide a snapshot of highlights from the past 10 years.

Prestigious events and speakers

High-profile speakers the Institute has hosted include Angel Gurría, Fatih Birol, Anthony Giddens, Cass Sunstein, Jeffrey Sachs, Catherine McKenna,



Patricia Espinosa, Executive Secretary of the United Nations Framework Convention on Climate Change, gives a speech in February 2017, entitled 'Climate change: from challenge to opportunity' (Photo: LSE)

James Hansen, Patricia Espinosa, Scott Barrett, Michael Greenstone, Judith Rodin and Hans-Werner Sinn.

Among the conferences the Institute has organised, an international meeting to mark the 10th anniversary of the publication of *The Economics of Climate Change: The Stern Review* stands out. Hosted in London in 2016 with CCCEP, it took stock of the extraordinary changes taking place in the global economy and sought to guide the development of research and policy about delivering the global agenda created by the Paris Agreement and Sustainable Development Goals. Following a keynote lecture from Professor Stern, speakers from finance, industry, international institutions and government gave speeches, including Debra Roberts (IPCC), Sir Suma Chakrabarti (European Bank for Reconstruction and Development), Rachel Kyte (UN Special Representative), Dr Vítor Gaspar (International Monetary Fund), Professor Laurence Tubiana (French ambassador and special representative for the Paris Conference), and Paul Polman (Unilever).



Awards to senior staff and associates

Professor Nicholas Stern was most recently made Companion of Honour in the Queen's Birthday Honours in June 2017 for services to economics, international relations and climate change. He was President of the British Academy between 2013 and 2017. In 2014 he was elected as a Fellow of the Royal Society in recognition of his work challenging the world view on the economics of climate change and for his distinguished career in mathematical economics with involvement in industry and in government.

Professor Judith Rees was awarded the title of Dame Commander (DBE) in 2013 for her services to higher education. In 2012 she was elected as the first woman President of Royal Geographical Society (with the Institute of British Geographers), a role she fulfilled until 2015.

Professor Simon Dietz was made a fellow of the Royal Society of the Arts in 2016. His awards include a teaching prize for outstanding teaching performance from the LSE in 2014, and several prizes for papers (see opposite).

Dr Misato Sato was awarded the Economic and Social Research Council's Future Research Leaders grant for 2016–2018.

Jeremy Grantham was named a Commander of the Order of the British Empire (CBE) in 2016. The previous year Jeremy Grantham and his wife Hanne, who together co-founded the Grantham Foundation for the Protection of the Environment, the Institute's lead donor, were honoured with the Carnegie Medal of Philanthropy.

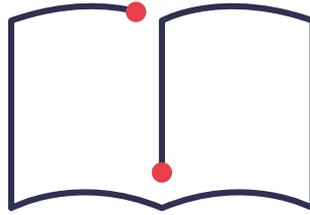
Awards for academic publishing

Staff at all levels, and PhD students, publish in the world's leading economics, environmental and social science journals. These include the *Journal of Environmental Economics and Management*, *Journal of the Association of Environmental and Resource Economists*, the *Review of Economics and Statistics*, *Global Environmental Change*, *Climatic Change*, *Nature Climate Change*, *Proceedings of the National Academy of Sciences*, *Economics and Philosophy* and *Risk Analysis*.

Several staff are editors or editorial advisers for international journals. Notably, under Declan Conway's editorship, the journal *Global Environmental Change* was ranked as the highest impact journal in the environmental sciences. Professor Conway is now on the journal's international editorial board, along with Professor Sam Fankhauser, who is also an editorial board member of *Climate Policy and Global Sustainability*. Professor Simon Dietz is a co-editor of the *Journal of the Association of Environmental and Resource Economists*, the world's leading environmental economics journal.

Institute staff and students that have won awards for papers and publications include:

- Simon Dietz and Alec Morton received the Best Paper Award 2011 from the Society for Risk Analysis.



- Antony Millner and Simon Dietz (with Geoffrey Heal) won the European Association of Environmental and Resource Economists (EAERE) award for outstanding publication in the journal *Environmental and Resource Economics* in 2013.
- In 2013 Antony Millner received the CESifo Distinguished Affiliate prize, which is awarded to young economists by the economic research group CESifo Group Munich.
- Former research officer Hélia Costa won the Italian Association of Environmental and Resources Economists (IAERE) Young Environmental Economist Award 2016.
- Jonathan Colmer, a former PhD student at the Institute, received the FEEM award for best young economist (sponsored by the Fondazione Eni Enrico Mattei) from the European Economic Association in 2013.
- Tobias Ketterer, a post-doctoral researcher, was awarded the 2014 Epainos young scientist prize from the European Regional Science Association.



"The Grantham Research Institute is one of the world's leading research centres focused on global environmental problems generally, and climate change in particular. Its outstanding staff of highly-qualified researchers have produced fundamental work on a variety of important topics – for example, the economic and social impacts of climate change, the role of technology in transitioning to lower emissions, the relationship between the environment and economic growth and development, and alternative approaches to reaching international climate agreements. The considerable volume of research has contributed enormously to our understanding of the environment and the design of environmental policy."

Professor Robert S. Pindyck,
MIT Sloan School of Management



"Within the remarkably short period of 10 years the Grantham Research Institute has established itself as a premier centre for the study of the economics of climate change. Its star researchers have used economic theory to develop the grammar of policy in an astonishingly fertile manner."

Professor Sir Partha Dasgupta,
Frank Ramsey Emeritus Professor of Economics, University of Cambridge



Grantham Research Institute website recognised for research impact

The Institute uses many channels to communicate its findings and its website won the Market Research Society award for policy/social research in 2015. This is an award that recognises the impact of research on the understanding of issues relating to, and decision-making within, the public policy and/or social arena. The judging panel acknowledged the success of the website, then recently redesigned, in increasing the Institute's engagement with policymakers.

10 minutes on 10 years with... Judith Rees



Judith Rees is currently the vice-chair of the Grantham Research Institute, having been one of its directors from 2008 until 2015. She was also director of the ESRC Centre for Climate Change Economics and Policy during its first phase from 2008 to 2012. Her distinguished academic career includes appointments as acting director of the LSE (May 2011–September 2012) and president of the Royal Geographical Society (with the Institute of British Geographers) (2012–2015). She served on the UN Secretary General's Advisory Board on Water and Sanitation, which was concerned with the implementation of the Millennium Development Goals, from its inception in 2004 until the end of its mission in 2016. Professor Rees was awarded the title of Commander of the Order of the British Empire (CBE) in 2006 and was made Dame Commander (DBE) in 2013.



What was the impetus for establishing the Grantham Research Institute?

By 2005 it was becoming apparent that research on the social science of climate change was lagging behind the physical science. As a world-leading research institution for the social sciences, LSE felt that it had some responsibility to help rectify that situation. It therefore created a small interdisciplinary network of researchers to develop research ideas and explore funding opportunities. This group was vastly strengthened by the appointment of Nicholas Stern, and of Simon Dietz, who had worked on *The Economics of Climate Change: The Stern Review*. The public and political reactions to the *Stern Review* convinced us that the time was right to try to launch a major initiative on climate change and the environment.

What made LSE the right place for the Institute?

LSE was well placed to create the interdisciplinary teams that would be essential if social science was to contribute to the step change needed to address the challenge of climate change. No single disciplinary perspective could provide all the answers. Initially, the climate change network involved collaboration between three established LSE research centres: the Centre for Environmental Policy and Governance (Geography), the Centre for the Analysis of Time Series (Statistics) and the Centre for Economic Performance (Economics), but we were able to pull in further experts from International Relations, Philosophy and Law. With seed funding from LSE, we began to develop a programme of work which we could present to potential funders.

In 2007, the Economic and Social Research Council (ESRC) announced

that it would hold a centre competition with climate change as one of its funding priorities. We made contact with colleagues in the School of Earth and Environmental Sciences at the University of Leeds, where staff had strengths in the climate sciences, climate impacts, adaptation and vulnerability, and experience of working in developing countries: strengths that complemented those of the LSE team.

While developing the joint research programme for the ESRC, we approached other funders as potential partners in the venture. This led us to the Grantham Foundation, which expressed interest in establishing a new institute. Together we made successful bids to the ESRC, and to German reinsurer Munich Re, and we established the Institute with the Centre for Climate Change Economics and Policy as an integral part [see p12]. The Institute's main initial research focus was on mitigation of climate change but as it became increasingly evident that warming was inevitable, research expanded to include adaptation. We also increased research on a wider range of environmental issues.

What particularly stands out for you in terms of the reputation the Institute has developed?

The Institute's reputation for research is particularly gratifying: we have really elevated the quality of applied environmental economics compared with earlier work in that field. Our staff and associates form one of the largest and best groups of environmental economists anywhere in the world. And through hiring early-career researchers we have started to improve the talent pool in social science work on climate change.

The Institute was founded very explicitly with an impact agenda: a mission to disseminate the conclusions of our work to decision-makers in governments, international institutions and business globally. The Institute has an excellent record

in advising policy- and decision-makers at the global and UK national levels. Nick Stern's reputation undoubtedly has been important in some of this work but the work of Bob Ward, leading our policy and communications team, has considerably amplified the impact of our academic outputs.

How do you see the work of the Institute developing in the future, particularly in relation to pressing global challenges?

I see continuing and deepening our work in addressing the agenda set by the Sustainable Development Goals as vitally important. Common themes including climate change and water issues cut across many of the Goals. We have long recognised the importance of the inter-relationships between environmental problems, resource security and sustainability issues – which is why 'environment' is included in the Institute's name.

"The Institute adds value by moving beyond hypothetical scenarios to providing practical, evidence-based recommendations."

We have seen the profound consequences that economic transitions like deindustrialisation can have on populations. The transition to a low-carbon economy has begun and it is increasingly urgent to find effective policy solutions now so that the continuing transition can be achieved in a fair and just way.

There is also space for further work on how governments can best finance the transition, and on the role of the private sector. The Institute adds value by moving beyond hypothetical scenarios to providing practical, evidence-based recommendations.

In terms of the way we conduct research, first, the problems we want to address continue to be multidisciplinary. We want to broaden our expertise further still, to include more researchers from law, sociology, international relations and politics. Staff from these disciplines can bolster our qualitative research approaches in particular.

Second, we need to continue and expand our collaborative work with governments, institutions and other groups, nationally and internationally, to jointly produce solutions to climate change and other environmental challenges. We have a once-in-a-generation opportunity to get this right. ●



Two women remove weeds in a plot in Wendu Bosseabe village, Senegal, part of the PRISE study area (see p13). Judith Rees views work on sustainable development as vitally important. (Photo: Lancelot Ehode – ICD Afrique/PRISE)

Supporting career progression

The Grantham Research Institute has been privileged to train a range of talented researchers and PhD students over the years, whose careers have, in turn, gained from their time at the Institute. These pages present a snapshot of just five research students and staff who have developed their work in particularly interesting and influential directions. The Institute has trained and educated several cohorts through PhD studentships and its Executive Summer School, as well as its contribution to Masters courses within LSE.



"I'm currently an Assistant Professorial Research Fellow at the Institute, and lead the Policy Design and Evaluation research group, having initially joined Grantham in 2008 as one of the Institute's first PhD students. The Institute really has offered a lively and inspirational environment, conducive to advancing my research interests and career. My research spans across topics on the implementation and impacts of climate and energy policies, and I have received tremendous support here, to publish widely on these topics, conduct policy work and also attract funding. I currently hold an ESRC Future Research Leaders award as Principal Investigator, and from this autumn, I will be taking up a new role as the deputy director of CCCEP as it transitions to its next phase."

Misato Sato, assistant professorial research fellow, Grantham Research Institute



"The Institute supported me to deepen and broaden my technical skills, gave me space to innovate, and diverse experiences working with governments, multilaterals and the private sector all over the world. The skills, networks and experience gained created a foundation to accelerate my career. At Grantham, I was obsessed with helping societies better manage the risks of disasters and my passion is unchanged! In 2013, the Institute supported me to take a secondment at the Department for International Development, which led on to a permanent job, and in 2016, to my current role as senior adviser on disaster risk financing and insurance, leading a team to deliver a major new policy agenda. Almost daily I draw upon the toolkit of skills that the Grantham Research Institute gave me."

Nicola Ranger, senior adviser, UK Department for International Development



"Not only were the four years I spent doing my PhD at the Grantham Research Institute some of the most intellectually stimulating and rewarding I have known, but they also directly contributed to my subsequent career path. The Institute's reputation directly opened doors into a private consultancy position in London, as well as extending internationally to my current role investigating New Zealand's transition to a low-emissions economy. My extended Grantham network has also been immensely valuable – personally knowing so many of the key people working in climate change economics and policy has made a massive difference to being able to stay at the cutting edge of knowledge in this area."

**Amelia Sharman, principal adviser,
New Zealand Productivity Commission**



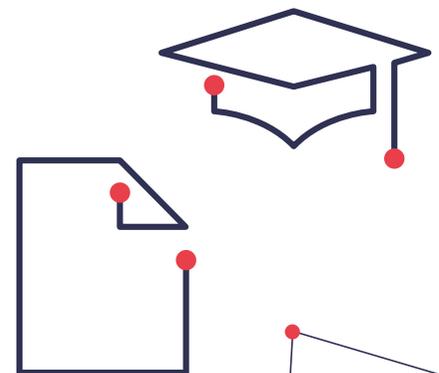
"The Grantham Research Institute provided a unique, interdisciplinary setting with strong links to climate change policymakers in which to write a high-quality, impact-oriented PhD on the strategic management of multilateral climate, trade and biosafety negotiations, and on how the negotiation process has a significant effect on outcomes. The Institute allowed me to carry out in-depth field research to dive deeply into the psychological dynamics of major global summits. Based on this research, I founded the Center for Multilateral Negotiations to assist in some of the most important global climate and trade negotiations, including the Paris Agreement."

**Kai Monheim, CEO, Egger Philips
Hamburg GmbH**



"My time at Grantham had an important impact on my academic career. The interdisciplinary nature of the Institute is inspiring and conducive to producing top academic research that led to subsequent careers at Yale and Princeton. Although the 'Behaviour' stream wasn't formally active yet at the time, I was one of the first students interested in this area. What's remarkable is that the Institute still gave me the space, resources and support to flourish in this field. In addition, the support I received from my LSE colleagues, especially my brilliant adviser, Richard Perkins, really helped shape me into the scholar I am today."

**Sander van der Linden,
director, Cambridge Social
Decision-Making Laboratory**



A last word from... Jeremy Grantham CBE



Dear Friends,

Humans are facing the race of our lives. Our destructive behaviour and reckless use of resources and natural systems, with accelerating climate damage, is hurtling us towards disaster. But we might just be saved by accelerating technological progress.

Climate change is already having impacts across the world and if it carries on unchecked, could be an existential threat to life on Earth. The huge risks can only be managed if individuals, communities, businesses and governments in every country act strongly and quickly to reduce their emissions of greenhouse gases and to make themselves more resilient to those consequences that cannot now be avoided.

The Paris Agreement set goals that, if achieved, would allow the world to avoid dangerous climate change. While many countries are working hard to implement the Agreement, those with vested interests in maintaining the status quo are using every means to slow down progress.

I am pleased that the Grantham Research Institute has been working tirelessly over the past 10 years to show a way ahead that is not a simple extension of the past century of ruinous fossil fuel use. It has shown that economics and social science, when applied in a thoughtful and robust way, can offer solutions to the stark set of problems we face.

As important, the Institute has been energetically engaging decision-makers to try to make it as difficult as possible to ignore the results of their rigorous independent research on important scientific, economic and policy issues, ranging from carbon pricing to the structure of international agreements.

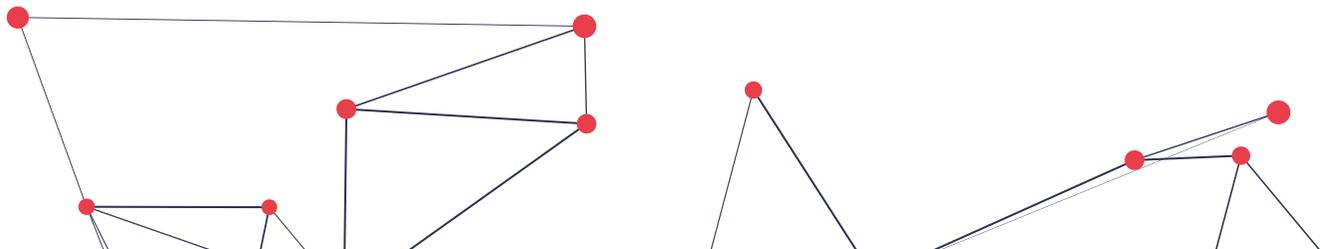
Above all else, the Institute has championed evidence and reason over ideology, vested interest and dogma. It is a sign of the times that such an approach has often caused controversy.

Despite the many successes documented in this publication, there is still much more for the Institute to do. The election of Donald Trump means not only that the United States may withdraw from the Paris Agreement, but also that those who oppose action on climate change have been emboldened in their efforts to obfuscate and obstruct.

The Institute must continue to produce world class research and policy analysis to inform decision-making at local, national and international level. It must challenge those who present fake trade-offs between the economy and the environment, or between prosperity and responsibility. And it must help the public and policymakers to distinguish between facts and fictions about climate change.

In short, it must do everything it can to ensure that we win the race of our lives.

Yours,
Jeremy Grantham CBE

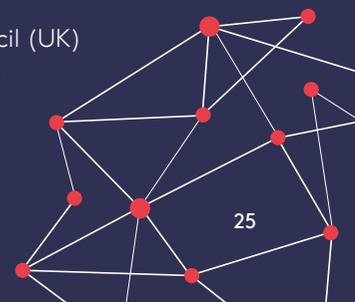




A 'thank you' from the Institute

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Since its inception in 2008, the Grantham Research Institute on Climate Change and the Environment has established a world-leading reputation for research and policy analysis on environmental problems, with a particular emphasis on climate change.

To learn more about joining the charitable foundations, businesses, government agencies and multilateral institutions that have supported the Institute's work since it was founded, please contact Sam Fankhauser, director: s.fankhauser@lse.ac.uk

Grantham Research Institute on
Climate Change and the Environment
London School of Economics
and Political Science
Houghton Street
London WC2A 2AE
UK

Tel +44 (0)20 7107 5027 / (0)20 7107 5440

Email Gri@lse.ac.uk

 [@GRI_LSE](https://twitter.com/GRI_LSE)

www.lse.ac.uk/GranthamInstitute

Project management and editing:
Georgina Kyriacou

Writing: Henry Rummins,
Georgina Kyriacou, Victoria Druce

Design: RF Design