Activities with Member Countries

Germany

Research collaborations between IIASA and Germany have been highly productive throughout IIASA’s history. Since 2008, this cooperation has involved over 70 German organizations and led to almost 900 joint scientific publications and wide-ranging policy advice delivered via organizations such as the German Advisory Council on Global Change (WBGU). Joint studies focus on the complex global systems that affect Germany, its economy, and its people. Research topics include transformation paths to a sustainable energy system, the impact of demographic change in Germany and optimizing strategies to reduce greenhouse gas emissions. Underpinning the joint work is systems analysis—one of the few research tools with the breadth and depth to explore these complex problems across multiple sectors, countries, and timeframes. IIASA’s collaborations are both applying these systems approaches and advancing the mathematical methods and models of systems analysis. Moreover, the next generation of system analysts are profiting from German involvement in IIASA’s capacity building activities. This mutually beneficial relationship involves significant scientific exchange, with over 600 visits from German researchers, advisors, and diplomats to IIASA, and over 300 visits by IIASA researchers to events and institutions in Germany. This IIASA Info Sheet provides a summary of interactions between IIASA and Germany since 2008.

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Activities with Member Countries: Germany

IIASA Info Sheet 2014/7
June 2014 (pages 1-3, 16-20 updated December 2015, pages 1, 5, 7 updated September 2017)

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IIASA Info Sheets provide succinct summaries of IIASA activities. They do not necessarily reflect the views of IIASA staff, visitors, or National Member Organizations.

This Info Sheet summarizes IIASA’s recent interactions with the Germany. It includes highlights with links to further information but is not meant to be a comprehensive report on all interactions.

Feedback and updates are encouraged and should be sent to Iain Stewart.
IIASA’s National Member Organization in Germany

The Association for the Advancement of IIASA is the National Member Organization (NMO) representing German membership of IIASA. When IIASA was established in 1972, both East and West Germany were founding members through the Academy of Sciences of the German Democratic Republic and the Max Planck Society for the Advancement of Sciences respectively. Today, Germany’s Federal Ministry of Education and Research (BMBF) funds the NMO and IIASA’s annual membership fee. The NMO is made up of 38 organizations from Germany (see Appendix 6) that work to strengthen connections between IIASA and Germany’s science and policy communities.

Professor Dr Helga Weisz, Head of Research Domain Transdisciplinary Concepts & Methods at Potsdam Institute for Climate Impact Research and Professor of Industrial Ecology and Climate Change at Humboldt University of Berlin, is the IIASA Council Member for Germany. The IIASA Council consists of one representative of each of IIASA’s member countries and is responsible for setting the overall strategic direction of the Institute as well as governing IIASA. Professor Weisz also serves as the Chair of IIASA Council’s Membership Committee which advises the Council on all issues related to membership.

An Executive Advisory Board advises the German NMO and its members (as of June 2014) reflect the main IIASA research fields:

Professor Dr. Ulrich Cubasch, Institute of Meteorology, Free University of Berlin
Dr. Jürgen-Friedrich Hake, Institute of Energy and Climate Research, Forschungszentrum Jülich
Professor Dr. Claudia Kemfert, Department of Energy, Transportation and Environment, German Institute for Economic Research (DIW Berlin)
Professor Dr. Peter Lemke, Climate Sciences Research Division, Alfred Wegener Institute for Polar and Marine Research
Professor Dr. Claudia Pahl-Wostl, Institute of Environmental Systems Research, University of Osnabrück
Professor Dr. Ortwin Renn (Vice Chair), Economic and Social Sciences Department, University of Stuttgart
Professor Dr. Helga Weisz (Chair), Potsdam Institute for Climate Impact Research and Humboldt University of Berlin
Professor Dr. Hermann Lotze-Campen, Potsdam Institute for Climate Impact Research and Humboldt University of Berlin, is the NMO Secretary for Germany.
Professor Dr Meinrat O. Andreae is Director of the Max-Planck Institute for Chemistry and was a member of IIASA’s Science Advisory Committee from 2007-13.

Professor Dr Guy Brasseur is the Director of the Climate Service Center in Hamburg and has been a long-term collaborator with IIASA.

Professor Dr Wolfgang Cramer is Scientific Director at the Mediterranean Institute for Biodiversity and Ecology. He has been a frequent visiting scholar to IIASA and is currently Chair of IIASA’s Evaluation Committee.

Professor Dr Paul Crutzen of the Max Planck Institute for Chemistry and Nobel Prize Laureate (Chemistry, 1995) was an IIASA Institute Scholar and a frequent collaborator with IIASA since the 1980s.

Professor Dr. Claudia Kemfert, Head of the Department of Energy, Transportation and Environment at the German Institute for Economic Research and Professor of energy and sustainability at the Hertie School of Governance, is a member of the Executive Advisory Board to the German NMO.

Professor Dr. Claudia Kemfert, Head of the Department of Energy, Transportation and Environment at the German Institute for Economic Research and Professor of energy and sustainability at the Hertie School of Governance, is a member of the Executive Advisory Board to the German NMO.

Professor Dr Mark Lawrence is Scientific Director at the Institute for Advanced Sustainability Studies (IASS) where he collaborates with IIASA on short-lived climate pollutants.

Professor Dr Dirk Messner is Director of the German Development Institute and Co-Chair of the German Advisory Council on Global Change (WBGU) where IIASA’s Deputy Director General also serves.

Professor Dr Felix Müller, Head of Department at the Institute for Natural Resource Conservation at the University of Kiel, is a collaborator with IIASA.

Professor Claudia Pahl-Wostl of the Institute of Environmental Systems Research at the University of Osnabrück served on IIASA’s Science Advisory Committee from 2007-12.

Professor Dr Ortwin Renn, Dean of the Economic and Social Sciences Department and Director of the Stuttgart Research Center for Interdisciplinary Risk and Innovation Studies, both at the University of Stuttgart, is Vice Chair of the Executive Advisory Board to the German NMO.

Professor Dr Hans Joachim Schellnhuber CBE, has been Director of PIK since he founded the institute in 1992. He is also Co-Chair of the German Advisory Council on Global Change (WBGU). He is a long-term collaborator with IIASA including serving as IIASA Council Member for Germany from 1994-6.

Professor Dr James W Vaupel, is Executive (and Founding) Director of the Max Planck Institute for Demographic Research. He has collaborated with IIASA’s demographers ever since he was an IIASA research scholar in the 1980s.

Professor Detlof von Winterfeldt was IIASA’s ninth Director (2009-12) and was born and educated in Germany. Currently, he is a Professor of Industrial and Systems Engineering and of Public Policy and Management at the University of Southern California.
Research Partners in Germany

IIASA works with research funders, academic institutions, policymakers and individual researchers in Germany. The following list includes the names of the organizations or the individual’s affiliated institutions that have all recently collaborated with IIASA.

- Agency for Renewable Resources (FNR – Fachagentur Nachwachsende Rohstoffe)
- Alfred Wegener Institute for Polar and Marine Research
- Association for the Advancement of IIASA (Vereinigung zur Förderung des Internationalen Instituts für Angewandte Systemanalyse)
- Berlin Institute for Population and Development (Berlin-Institut für Bevölkerung und Entwicklung)
- Carl von Ossietzky University of Oldenburg (Carl von Ossietzky Universität Oldenburg)
- Centre for European Economic Research (ZEW – Zentrum für Europäische Wirtschaftsforschung)
- Climate Analytics
- Climate Service Center (CSC)
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
- Ecologic Institute (Ökologisches Institut)
- European Centre for Agricultural, Regional and Environmental Policy Research (EuroCARE)
- FastOpt
- Federal Enviroment Agency (UBA – Umweltbundesamt)
- Federal Institute for Geosciences and Natural Resources (BGR - Bundesanstalt für Geowissenschaften und Rohstoffe)
- Federal Ministry for Economic Cooperation and Development (BMZ - Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung)
- Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB – Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit)
- Federal Ministry of Education and Research (BMBF - Bundesministerium für Bildung und Forschung)
- Forschungszentrum Jülich
- Fraunhofer Institute for Systems and Innovation (Fraunhofer ISI – Fraunhofer Institut für System und Innovationsforschung)
- French-German Institute for Environmental Research (DFIU – Deutsch-Französisches Institut für Umweltforschung)
- Friedrich Schiller University Jena (Friedrich-Schiller-Universität Jena)
- German Advisory Council on Global Change (WBGU - Wissenschaftliche Beirat der Bundesregierung Globale Umweltveränderungen)
- German Aerospace Center (DLR – Deutsches Zentrum für Luft- und Raumfahrt)
- German Centre of Gerontology (DZA – Deutsches Zentrum für Altersfragen)
- German Committee for Disaster Reduction (DKKV – Deutsches Komitee Katastrophenvorsorge)
- German Development Institute (DIE – Deutsches Institut für Entwicklungspolitik)
- Germanwatch
- Global Climate Forum (GCF)
- Goethe University Frankfurt (Goethe-Universität)
- Hamburg Institute of International Economics (HWWI)
- Helmholtz-Zentrum Geesthacht – Centre for Materials and Coastal Research (HZG - Helmholtz Zentrum Geesthacht – Zentrum für Material- und Küstenforschung)
- Helmholtz Centre for Environmental Research (UFZ - Helmholtz-Zentrum für Umweltforschung)
- Helmholtz Centre Potsdam - German Research Centre for Geosciences (GEF - Helmholtz-Zentrum Potsdam - Deutsches GeoForschungsZentrum)

IIASA is continually developing collaborations with Germany and has recently been working with 74 organizations in Germany via formal and informal connections.
Institute for Advanced Sustainability Studies (IASS)
Institute for Social-Ecological Research (ISOE – Institut für sozial-ökologische Forschung)
International Institute for Sustainability Analysis and Strategy (IINAS – Internationales Institut für Nachhaltigkeitsanalysen und -strategien)
Jacobs University
Johann Heinrich von Thünen Institute, Federal Research Institute for Rural Areas, Forestry, and Fisheries (Johann Heinrich von Thünen-Institut, Bundesforschungs institut für Ländliche Räume, Wald und Fischerei)
Karlsruhe Institute of Technology (KIT – Karlsruher Institut für Technologie)
Leibniz Centre for Agricultural Landscape Research
Leibniz Institute for Freshwater Ecology and Inland Fisheries (IGB)
Leibniz Universität Hannover
Max Planck Institute for Biogeochemistry (Max-Planck-Institut für Biogeochemie)
Max Planck Institute for Chemistry (Max-Planck-Institut für Chemie)
Max Planck Institute for Demographic Research (MPIDR - Max-Planck-Institut für demografische Forschung)
Max Planck Institute for Meteorology (MPI-M – Max-Planck-Institut für Meteorologie)
Max Planck Institute for the Physics of Complex Systems (Max-Planck-Institut für Physik komplexer Systeme)
Max Planck Society (Max-Planck-Gesellschaft)
Mercator Research Institute on Global Commons and Climate Change (MCC)
Munich Climate Change Insurance Initiative (MCII)
Potsdam Institute for Climate Impact Research (PIK – Potsdam-Institut für Klimafolgenforschung)
Renewable Grid Initiative, Berlin
RWTH Aachen University
SYNCOM
TU Dortmund University (Technische Universität Dortmund)
Thünen Institute of Climate-Smart Agriculture (Thünen Institut für Agrarklimaschutz)
University of Bamberg (Otto-Friedrich-Universität Bamberg)
University of Bonn (Universität Bonn)
University of Duisburg-Essen (Universität Duisburg-Essen)
University of Freiburg (Albert-Ludwigs-Universität Freiburg)
University of the German Federal Armed Forces, Munich (Universität der Bundeswehr München)
University of Hamburg (Universität Hamburg)
University of Heidelberg (Universität Heidelberg)
University of Kassel (Universität Kassel)
University of Kiel (CAU – Christian-Albrechts-Universität zu Kiel)
University of Konstanz (Universität Konstanz)
University of Leipzig (Universität Leipzig)
University of Potsdam (Universität Potsdam)
University of Stuttgart (Universität Stuttgart)
University of Würzburg (Universität Würzburg)
Weihenstephan-Triesdorf University of Applied Sciences (Hochschule Weihenstephan-Triesdorf)
WIP – Renewable Energies
Wuppertal Institute for Climate, Environment and Energy (Wuppertal Institut für Klima, Umwelt, Energie)
Recent Research Collaborations

Transitions toward a sustainable energy future

Germany has adopted a policy of energy transformation (Energiewende) to shift from nuclear and fossil fuels to renewable energy with nationally agreed targets of increasing renewable energy’s share of the country’s energy use to 60% by 2050 among other energy objectives. Achieving these goals requires a thorough understanding of the complex global energy system and its multiple connections with Germany’s economy, environment, and society. Integrated, international assessments are one of the few research approaches that has the breadth and depth to explore such complex problems across multiple sectors, regions, and timeframes. IIASA has developed substantial expertise in international energy assessments ever since the Institute’s researchers carried out the first comprehensive, truly global assessment of energy issues (1973 – 1981) under the leadership of the German energy expert, Wolf Häfele.

Most recently, IIASA led the Global Energy Assessment (GEA), from 2006-12, in which a new global energy policy agenda is defined—one that transforms the way society thinks about, uses, and delivers energy. GEA involved over 500 specialists from a range of disciplines, industry groups, and policy areas, to identify pathways and policies to facilitate equitable and sustainable energy services for all:

- Germany was a significant contributor to the GEA with Manfred Konukiewitz of the German Federal Ministry for Economic Cooperation and Development and John Schellnhuber, Director of the Potsdam Institute for Climate Impact Research serving on GEA governing Council. Over 50 German researchers authored or reviewed the assessment and one German organization (Deutsche Gesellschaft für Internationale Zusammenarbeit) sponsored the GEA.
- Findings relevant to Germany were outlined at the German launch of the GEA by IIASA at the Federal Ministry for the Environment in Berlin in 2012. Areas of particular interest were the analysis of the major energy challenges, the evaluation of the energy resources and technological options available to build a sustainable energy system, and the policies and investments needed to make these future systems a reality.
- Outcomes from the GEA also included the adoption of GEA’s findings as the three key objectives of the UN Secretary-General’s Sustainable Energy For All (SE4ALL) initiative on energy access, energy efficiency, and renewable energy.

Other German-IIASA collaborations have explored the roles that technology, risk, and the environment can play in energy transitions:

- With the Potsdam Institute on Climate Change (PIK) and Stanford University’s Energy Modeling Forum (EMF), IIASA coordinated a major research project combining 18 different global energy-economy models to explore the role of technology for achieving ambitious climate targets.
- IIASA’s risk experts have collaborated with a range of German researchers at PIK, the Renewable Grid Initiative, and University of Hamburg on the opportunities and risks of using concentrated solar power from North Africa to fuel Europe, and the barriers to expanding EU electricity grids.
- In collaboration with Carl von Ossietzky University of Oldenburg and PIK, IIASA researched the long-term investment decisions among companies in the electricity sector to analyze how much they deviated from the rational actions assumed by standard economic theory. The project, named ALICE (2008-10), was funded by the Federal Ministry for Education and Research.
- The German Aerospace Center (DLR) and IIASA partnered on the EU-funded EnerGEO project (2009-13) to assess the current and future impact of energy use on the environment by linking environmental observation systems with the processes involved in exploiting energy resources.

Finally, IIASA’s energy research is heard at the highest levels in Germany via IIASA’s Deputy Director General, Nebojsa Nakicenovic’s membership of the German Advisory Council on Global Change (WBGU) since 2008. WBGU advises the German government on global environmental
Joint German-IIASA studies are developing and applying integrated assessment models to identify strategies to reduce greenhouse gas emissions.

**Research collaborations to tackle climate change**

Achieving Germany’s goal of reducing greenhouse gas emissions by 80–95% by 2050 will require adopting and implementing the most effective and efficient strategies. The holistic approach of systems analysis can help identify strategies that reap multiple benefits across sectors and regions, as well as avoid policies that lead to negative side effects in remotely connected activities. Numerous joint studies between IIASA and German researchers have adopted this approach through the use of integrated assessment models and have been exploring how to tackle climate change from multiple angles:

IIASA’s integrated assessment model, GAINS, identifies smart mixes of measures to simultaneously cut air pollution and greenhouse gas emissions in the most cost-effective way. It has been applied successfully to many international environmental negotiations. Experts from the Federal Environment Agency have visited IIASA to learn more about GAINS and how it guides EU policy. Other German-IIASA collaborations using GAINS include:

- IIASA led a consortium of organizations including the University of Bonn as part of the EU-funded EC4MACS project (2007-13) to develop a toolbox of well-established modelling tools to enable policy makers to explore the synergies and interactions between climate change, air quality and other policy objectives including EU energy, transport and agricultural policies. The research has informed the revision of the EU’s Thematic Strategy on Air Pollution in 2013.
- Germany is a party to the Convention on Long-Range Transboundary Air Pollution—one of the first international environmental treaties that has helped Europe slash air pollution. At the centre of the treaty is IIASA’s GAINS model, and the Convention, through its Network for Integrated Assessment Modeling (NIAM), has encouraged parties to collaborate with IIASA and develop their own national integrated assessment models as a means to enhance national activities to cut air pollutants. The French-German Institute for Environmental Research (DFIU-IFARE) is part of NIAM and has collaborated with the GAINS team to establish a German integrated assessment model to analyze measures to tackle air pollution.
- German researchers from the Institute for Advanced Sustainability Studies and the University of Leipzig have collaborated with the IIASA GAINS modeling team to identify measures to curb the release of short-lived climate pollutants on the EU-funded project ECLIPSE (2011-14).

IIASA’s work is underpinned by high-quality science, which is regularly published in high impact publications. A selection of current publications is presented here and full list can be found in appendix 5:

An earlier holistic analysis of the short-lived climate pollutants by the GAINS team and international partners had shown the multiple benefits of reducing these pollutants for near-term climate change, food and energy security, the environment and public health.

IIASA and German researchers used GAINS to improve our understanding of emissions from agriculture, including with the University of Bonn on projections of these emissions, and with the Thünen Institute of Climate-Smart Agriculture on the potentials for reducing such emissions.

The EU-funded ECLAIRE project with the Forschungszentrum Jülich, Karlsruhe Institute of Technology, the University of Bonn, and IIASA, is researching the effects of climate change on Europe’s ecosystems (2011-15).

And IIASA is working with the Max Planck Institutes for Meteorology and for Chemistry on the EU-funded PEGASOS (2011-14) to enhance our understanding of the interactions of climate and atmospheric chemistry in the past, present and future.

Other collaborations in applying integrated assessment models have used IIASA’s MESSAGE (Model for Energy Supply Strategy Alternatives and their General Environmental Impact) model which aids medium- to long-term energy system planning, energy policy analysis, and scenario development. These include:

- Joint studies with PIK on: (1) the co-benefits of climate policy for air pollution, energy security and economic growth as part of the EU-funded LIMITS project (2011-14); (2) mitigation pathways and associated costs as part of the EU-funded AMPERE project (2011-14) along with researchers from the University of Stuttgart and Climate Analytics; and (3) the analysis of costs and impacts of mitigation policies in order to trigger the development of a new generation of Integrated Assessment Models as part of the EU-funded ADVANCE project which started in 2013 and also includes DLR as a project partner.

- DLR also partnered with IIASA to generate a permanent monitoring system of key factors relevant to the development of the air transport sector ranging from passenger date to greenhouse gas emissions to population change as part of the EU-funded MONITOR project which finished in 2011.

- As authors of the IPCC Working Group III Fifth Assessment Report, IIASA researchers worked with researchers at Ecofys, Centre for European Economic Research (ZEW), Mercator Research Institute on Global Commons and Climate Change (MCC), PIK, University of Leipzig, Wuppertal Institute for Climate, Environment and Energy.

Finally, IIASA and PIK are working to facilitate the integrated analysis of future climate impacts, vulnerabilities, adaptation, and mitigation, through playing leading roles in the development of the Shared Socioeconomic Pathways (SSPs)—part of the new scenario process of the IPCC’s Fifth Assessment Report.

IIASA was established in 1972 to use scientific cooperation to build bridges across the Cold War divide and research growing global problems on a truly international scale. Today the soft power of science diplomacy continues to help IIASA’s member countries through using scientific cooperation to improve international relations, and through international teams jointly researching controversial issues to find consensus such as through integrative assessments of the future for the Arctic or of the economic integration of Eurasia.

In addition, IIASA also maintains its original bridge-building objective through attracting member countries that represent a range of geo-political interests (see full list of members: Back page). For instance, both Russia and the US are members; as are Brazil, China, India, and South Africa. Several key factors also unite all IIASA member countries: their interest in systems analysis, scientific and academic infrastructure, economic stability and the geopolitical role in future global transitions. With this in mind, IIASA is also exploring closer collaboration with countries in the Middle East.
Projecting demographic change in Germany

IIASA’s demographers study and project the changing composition of population for all countries of the world. They produce one of the few independent alternatives to the demographic projections of the UN Population Division. As a testament to the quality of IIASA’s demography, the IPCC in 2011 adopted IIASA’s population projections as its source data in all modeling for the Fifth Assessment Report; and UNESCO has adopted IIASA’s demographic methods as part of its literacy forecasting.

The Institute’s interdisciplinary setting has encouraged its demographers to research beyond the traditional boundaries of demography and to explore how changes in society, economy, and the natural environment influence the health and mortality, migratory patterns, and reproductive behavior of human society.

A recent innovative example of this broader approach has been the development of research methods to project population by level of education. This equips researchers with the tools to explore the implications of different education policies on a country’s future fertility, life expectancy, migration, and population level as well as economic growth and ability to adapt to climate change. In 2014 IIASA will publish the first projections of educational attainment by age and sex for 195 countries with Oxford University Press. Findings for Germany show how different policies over the next few decades could lead to the country’s 2010 population of 82.3 million remaining close to 82 million by 2060 or falling to around 60 million.

Other population studies research aging:

- An analysis with the Max Planck Institute for Demographic Research explored the advantages of demographic change leading to fewer, older people who were smarter and healthier.
- A study researched aging based not on people’s chronological age but on remaining life expectancy, people’s health and cognitive function among other measures for Germany, Japan, Russia, and the US.
- Researchers from IIASA and the German Centre of Gerontology (DZA) analyzed the impact of rapid technological change between 1986 and 2006 on the type of work and wages among German men of different age groups.

Many of today’s most pressing challenges do not stop at international borders. IIASA’s research areas such as climate change, water scarcity, and poverty are affected by multiple factors across the globe. In turn these global problems have impacts on nations, regions, and continents. Finding long-lasting solutions to these challenges requires scientific expertise that is free from the interests of a single nation. IIASA’s National Member Organizations recognize this need and that their investment in IIASA is a contribution to a global public good. And the benefit of this contribution is paid back to global researchers, policymakers, and citizens in multiple ways as the following examples show:

1. IIASA supports the climate change research community by hosting the Representative Concentration Pathways (RCP) database. The database provides data on greenhouse gas emissions for four different future scenarios that underpin the analysis of thousands of climate change researchers. IIASA also calculated the data for one of the scenarios, all of which have been developed for the world’s most comprehensive analysis of climate change—the IPCC’s (Intergovernmental Panel on Climate Change) Fifth Assessment Report.

2. IIASA’s research provides scientific guidance to the Convention on Long-range Transboundary Air Pollution of the United Nations Economic Commission for Europe. This international environmental treaty between 33 countries has slashed air pollution in Europe, improving people’s health and countries’ crop production. IIASA’s GAINS model guided negotiators and policymakers as they worked on the treaty to identify the most cost-effective approach to cleaning Europe’s air. The negotiators chose the GAINS model not only because of its accuracy and usability but also because it had been developed by an international team with funding from multiple countries, which assured them that the model was nationally unbiased.
Research with Otto Friedrich University examined the relationships between cognitive performance, social participation and behavioral risks, taking into account age and educational attainment.

Collaborations between IIASA and Jacobs University include: (1) findings that older people were perceived as more competent in countries in which more older people participated in paid or volunteer work, independent of life expectancy and the average education, gender makeup, and average cognitive abilities of the older population; and (2) an investigation into changing cognitive abilities among people over 50.

Other German-IIASA collaborations use demographic techniques to analyze migration and secularization, including:

- A study into how climate-related changes to the environment may be the trigger for migratory movement through a case study of the Sahel in collaboration with the Institute for Social-Ecological Research (ISOE), Frankfurt.
- A demographic analysis of religious secularization in East and West Germany based on age and gender over the last 40 years.

**The carbon cycle, farmland, and forests**

IIASA works with a range of German research institutions to explore different aspects of the global carbon cycle in order to reduce the huge scientific uncertainties surrounding how the natural world both releases and absorbs greenhouse gases, which in turn will improve climate change predictions. Collaborations range from remote sensing to forest management to biofuels and include:

- On-going studies with Friedrich Schiller University Jena are harnessing the power of satellite imagery to remotely observe different elements of the carbon cycle and then develop and test different techniques to process this wealth of information into inventories that researchers can use to monitor the release and uptake of greenhouse gas emissions. Current work includes an assessment of Northern Eurasian forests in the EU-funded ZAPAS project (2011-14). Further research with PIK and the Universities of Hamburg and of Freiburg analyzed the benefits of using satellite imagery not just in the study of climate change but also for energy, water, agriculture and ecosystem research as part of the EU-funded GEOBENE project (2006-09). And IIASA is working with the Max Planck Institute for Biogeochemistry, FastOpt, and the University of Hamburg to develop an operational global integrated carbon observation and analysis system as part of the EU-funded GEOCarbon project (2011-14).
- IIASA’s global land use model GLOBIOM and its global forestry model G4M support multiple research projects that have improved our understanding of how Europe’s forests and farmland -- and people’s management of them -- release and absorb greenhouse gases. Other collaborations use the models to analyze how climate change and associated government policies impact Europe’s agricultural and forestry sectors, which account for some 50% of Europe’s land surface. Projects and partners include:
  - The EU-funded GHG Europe project (2010-13) with Johann Heinrich von Thünen Institute, Max Planck Institute for Biogeochemistry, Weihenstephan-Triesdorf University of Applied Sciences, University of Heidelberg, and PIK.
  - The European Centre for Agricultural, Regional and Environmental Policy Research (EuroCARE) on the EU-funded EUCLIMIT project (2011-14).
  - The EU-funded CC-TAME project (2008-11) with EuroCARE and the Max Planck Institute for Meteorology.
  - Helmholtz-Zentrum Geesthacht - Centre for Materials and Coastal Research (HZG), Global Climate Forum, and PIK on the EU-funded IMPACT2C project (2011-15).
- The impact of extreme weather events on the carbon cycle is the focus of the EU-funded CARBOn Extreme project (2009-15), which is coordinated by the Max Planck Institute for Biogeochemistry and the Max Planck Institute for Meteorology, and includes IIASA, Leibniz University Hannover, and PIK as project partners. Together they are improving our understanding of how extreme weather events impact the Earth’s ability to absorb carbon; early findings from the project appeared in *Nature* in 2013.
IIASA's researchers also explore land-use sector policies to address climate change, including biofuels and REDD (Reducing Emissions from Deforestation and forest Degradation):

- Funded by the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), IIASA and international partners are developing technical know-how and capacity in designing efficient, effective and environmentally relevant policy strategies for REDD.

- Mercator Research Institute on Global Commons and Climate Change (MCC), IIASA, and other partners are analyzing incentives to protect global forests in the future via REDD schemes.

- The Universities of Freiburg and Hamburg, along with IIASA and other partners, harmonized methodologies to assess the biomass resources for energy purposes in Europe as part of the EU-funded BEE project (2008-10).

- The EU-funded S2Biom project (2013-16) is developing research tools and a roadmap for Europe to make more efficient use of the continent’s biomass resources. German partners include: Agency for Renewable Resources (FNR), International Institute for Sustainability Analysis and Strategy, SYNCOM, the University of Freiburg, and WIP – Renewable Energies.

Other research has developed new indicators: (1) for land-use as part of a project funded by Germany’s Environmental Agency and (2) for sustainable development as part of the EU-funded IN-STREAM project (2008-11) with the Centre for European Economic Research, the Ecologic Institute, and the University of Stuttgart.

Finally, IIASA collaborates with PIK on pioneering studies to conduct multiple model assessments of the impacts of climate change (ISI-MIP) and of agricultural production (AgMIP). By carrying through intense data gathering, computer modeling, and other advanced research methods, IIASA provides a country’s researchers and their policymakers with the essential numbers and tools to select the most effective policies. For example:

- Transport is one of the key contributors to past and future climate change. Historical emissions from transportation contributed to about 9% of temperature change in 2000, and this share may increase to 20% by 2100. IIASA research analyzed the climate impact of Germans travelling nationally and internationally. The analysis found the total climate impact is determined almost entirely by car (~46%) and air travel (~45%), with smaller contributions from public transportation. The wealthiest top 10% of the German population is responsible for almost 20% of the total climate impact of travel, but two-thirds of climate impact comes from the broad middle classes. The study also showed that the few long trips (longer than 100 km, by any means of transport) stand for more than half of the total climate impact with one long-distance holiday return trip having the same impact as more than two months of regular urban travel. The research concluded that a combination of different behavioral changes, efficiency improvements and transport policies will be needed to mitigate emissions from travel. (Source: Aamaas B, Borken-Kleefeld J, Peters GP (2013). The climate impact of travel behavior: A German case study with illustrative mitigation options. Environmental Science & Policy 33:273-282)

Many of the research projects summarized in this Info Sheet draw on analyses from IIASA’s models, tools, and data including:

- Reducing air pollutants and greenhouse gas emissions simultaneously (GAINS model).
- Planning a sustainable energy system (MESSAGE model, Global Energy Assessment Scenario Database).
- Reducing energy poverty (Energy Access Interactive Tool [ENACT]).
- Improving food security through identifying yield gaps (GAEZ model) and assessing competition for land use between agriculture, bioenergy, and forestry (GLOBIOM model).
- Financial disaster risk management (CATSIM model).
- Projecting future population (Demographic multistate modeling).
out comprehensive and rigorous model inter-comparisons, researchers find more robust findings and improve the underlying models. Results have recently been published in a 2013 special issue of PNAS. Other German partners on these studies include: Goethe University Frankfurt, Karlsruhe Institute of Technology, Max Planck Institute for Biogeochemistry, Max Planck Institute for Meteorology, University of Bonn, and University of Kassel.

**Increasing climate and disaster resilience**

Joint research has assessed ways to improve proactive climate and disaster risk management through helping countries and sectors prepare for natural disasters, providing management tools for those working in disaster prevention and emergency preparation roles, and identifying effective ways to adapt to anticipated changes from climate change.

- Improving disaster risk management via the development of IIASA’s CATSIM model, which has helped countries, including Madagascar and Mexico, to prepare public finances to fund rescue, recovery and re-building in case of major natural disaster. CATSIM has been used in the EU-funded MEDIATION project (2011-15) which involved IIASA and nine research partners including the Global Climate Forum (GCF) and PIK.
- Using insurance, including public-private arrangements with international support, to help vulnerable countries adapt to climate change and extreme events was developed into a proposal at the UN Climate Change conference in Copenhagen in 2009 by Germanwatch, the Munich Climate Change Insurance Initiative, and IIASA.
- Decision support tools include: (1) landslide risk management tools as part of the EU-funded Safelands project (2009-12) which included the Max Planck Society as a research partner; (2) multiple hazard management tools from an analysis with the German Committee for Disaster Reduction (DKKV), Helmholtz Centre Potsdam, and Karlsruhe Institute of Technology; (3) new multi-sector partnerships to reduce or redistribute risk as part of the EU-funded ENHANCE project (2012-16) and including German partners HZG and Potsdam University.
- A collaboration with the Technical University Dortmund and other partners is modeling the anticipated changes in natural disaster patterns in Europe in order to assist emergency preparedness officials and to train young scientists in the risk management skills needed to respond to future disasters. The joint study is an EU-funded project, CHANGES, running from 2011-14.
- Other climate change adaptation studies include: (1) developing methods to appraise different climate change adaptation actions, including the management of extreme weather events, as part of the EU-funded ECONADAPT project (2013-16) with Ecologic Institute and PIK among other partners; (2) an analysis of economic instruments to incentivize adaptation to climate change with the Hamburg Institute of International Economics; and (3) assessing the biophysical impacts and socio-economic risks associated with a global temperature increase of 2°C for Europe and the most vulnerable regions of the world with the Climate Service Center, Hamburg as part of the EU-funded IMPACT2C project (2011-15).

**Basic research: Advancing the methods of systems analysis**

Advancing the methods of systems analysis ensures system analysts, both at IIASA and elsewhere, are equipped with the latest research tools. IIASA has recently worked with German organizations in a range of collaborations to advance data quality and research methods, these include:

- Accurate data underpins all studies. Over the past 5 years as part of the Geo-Wiki project, IIASA and partners including the University of Freiburg have been leading a team of citizen scientists to improve maps of different land uses by examining satellite data to identify exactly how people use the land. The rise of citizen scientists provides potential to radically improve the accuracy of maps and subsequently the quality of the research and policy recommendations that are based on mapping data.
  - Researchers from IIASA and the Federal Institute for Geosciences and Natural Resources (BLR) are also collaborating on the ICT COST Action TD1202 project (2012-16) to explore and enhance the role that citizen scientists play in mapping.
One question the research teams always get is whether the analysis from laypeople is as good as that from experts. In other words, can they rely on non-experts to provide accurate data analysis? Together with a researcher from the University of Freiburg, IIASA researchers showed in the journal PLOS ONE (2013) that data gathered and analyzed by non-experts can rival the quality of data from experts.

IIASA brings its expertise in modeling complex systems including characteristics such as thresholds, feedback loops, avalanche effects, and irreversibility, to the EU-funded project, COMPLEX (2012-16), which includes the Max Planck Institute for Meteorology. The researchers are developing a suite of modeling tools and decision-support systems to inform national and supra-national policy and support communities across Europe working to make the transition to a low-carbon economy.

IIASA’s mathematicians also work with researchers from the University of the German Federal Armed Forces and the University of Duisburg-Essen on economic and environmental modeling; with RWTH Aachen University on multiple criteria analysis; and with the University of Kiel on using different indicators as a means to understand long-term ecosystem dynamics.

The future of fisheries

Seafood is the primary source of animal protein for more than one billion people. Many developing nations and coastal communities depend on fisheries. However, expanding food production from fisheries is hindered by rampant overfishing and changes in marine habitats. By combining fields of expertise as diverse as population genetics, evolutionary theory, and fisheries science, IIASA’s researchers have been analyzing the consequences of commercial fishing practices on the evolution of fish. Collaborations with Germany include:

- Ongoing collaborations with the Leibnitz Institute for Freshwater Ecology and Inland Fisheries (IGB) build on the ADAPTFISH project through developing models to explore the evolution of fish, the impact of angler behavior, and the implications for fisheries management.
- The Leibnitz Institute was also a partner on the EU-funded UNCOVER project (2006-10) which explored the decline of fish stocks and how best to implement stock recovery plans. Other German partners included the Johann Heinrich von Thünen Institute and the University of Hamburg.
- Two networking activities, the EU-funded FINE program (2007-10) and European Science Foundation-funded FROSPECTS program (2008-13), facilitated international and interdisciplinary collaborations on fisheries-induced evolution and speciation respectively. The Federal Research Centre for Fisheries (BFAF), now part of the Johann Heinrich von Thünen Institute, and the University of Konstanz were among the partners.
- Other studies with German researchers have investigated the role evolution plays in biodiversity. Activities include:
  - Joint studies with the Max Planck Institute for the Physics of the Complex Systems into food webs.
  - Research into the role of evolution in the coexistence of species with Helmholtz Centre for Environmental Research and the University of Freiburg.
  - Ongoing research collaboration with the University of Würzburg on the evolution of dispersal distance.

Analyzing global and European water challenges

Progress toward meeting global water challenges has not been enough. For example, 770 million people lack access to improved sources of drinking water, and 35 million die prematurely each year from water-related diseases. In 2013, IIASA launched a new flagship initiative, Water Futures and Solutions, to conduct an integrated analysis of global water challenges and solutions. This study builds on previous collaborations with German institutions including:

- IIASA’s water experts joined hydrologists, climate change specialists, and agricultural scholars among other disciplines to contributed to the EU-funded WATCH project (2007-2011) to assess the vulnerability of global water resources. German partners in the project were the Max Plank Institute for Meteorology, PIK, and the Universities of Frankfurt and of Kassel.
The University of Kassel also worked with IIASA on the EU-funded SCENES project (2006-10) to produce a set of comprehensive scenarios of Europe's freshwater futures up to 2025. Currently, IIASA's water experts are working with the Center for Environmental Systems Research at the University of Kassel to contribute to UNEP's World Water Quality Assessment and identify problem areas of freshwater quality and evaluate policies to address water pollution.

Business can benefit from science through the analysis and knowledge it provides. In turn, science can benefit from business through its experience on the ground and in implementation. IIASA also recognizes that closer collaboration between business and its researchers can increase the impact of the Institute's work. Not surprisingly, IIASA is seeing a growing number of contracts with commercial partners, including:

- The global insurer, Zurich Insurance Group, began working with IIASA in 2013 to identify and address research gaps on flood resilience and community-based disaster risk reduction, demonstrate the benefits of pre-event risk reduction over post-event disaster relief and to improve public dialogue around disaster resilience.
- The German carmaker, Daimler AG, has collaborated with IIASA researchers to assess biofuel potential from marginal and degraded lands in India and Brazil.
- The Brazilian energy company, Petrolero Brasileiro, was one of nineteen sponsors of IIASA's Global Energy Assessment.
- The research institute of the Japanese carmaker, Toyota, has ongoing collaboration with IIASA to research measures to reduce ozone emissions in Asia.
- The multinational consumer goods company, Unilever, funded IIASA's agricultural experts from 2008-10 to analyze yields and land suitability of key agricultural crops under a changing climate.

Other interactions with business include researching with German organizations, 50Hertz and Tennet how to expand the European electricity grid to integrate a growing share of electricity from renewable sources as part of the EU-funded BESTGRID project (2013-15). In addition, IIASA is exploring ways that it can work more closely with multinational corporations, including Anglo-Dutch corporations Unilever and Shell, particularly through input to the development of their global sustainable business plans.
Capacity Building

Young Scientists Summer Program

The Young Scientists Summer Program (YSSP) develops the research skills and networks of talented PhD students. Program participants conduct independent research within the Institute's research programs under the guidance of IIASA scientific staff. Since the start of the YSSP in 1977, 120 students from Germany have taken part in the program. Funding is provided through IIASA's German National Member Organization unless otherwise stated. The following 24 young researchers from Germany or undertaking a PhD in Germany have participated in this program since 2008:

Oludunsin Arodudu (YSSP '15 & Leibniz Centre for Agricultural Landscape Research) conducted a spatio-temporal analysis of life-cycle assessment indicators within a sustainability assessment framework for assessing agro-bioenergy land use.

Christoph Bertram (YSSP '12 & Potsdam Institute for Climate Impact Research) modeled how energy demand and emissions in the industry sector may evolve under different technology, energy supply, resource, and emission price assumptions.

Veronika Bertram Hümmer (YSSP '13 & Humboldt University) researched how Mongolian nomadic households cope with and reduce the risks caused by dry summers and harsh winters—something that is expected to increase with climate change.

Sebastian Busch (YSSP '12 & Vienna University of Technology), a German national, developed a regulatory framework to facilitate cooperation among European states on the generation and transmission of renewable energy.

Erasmus Zu Ermgassen (YSSP '15 & University of Cambridge), a German national, studied the influence of property size on sustainable agricultural intensification in Mato Grosso, Brazil.

Franziska Gaupp (YSSP '15 & University of Oxford), a German national, investigated globally correlated drought events in six major food-producing areas and their overall influence on agricultural production.

Hans-Christian Gils (YSSP '11 & German Aerospace Center) assessed the potential for combined heat and power production in Europe and its effect on emissions of air pollutants and greenhouse gases.

Juliana Gil (YSSP '13 & University of Hohenheim) explored how anti-deforestation measures and high grain prices may lead to livestock farming intensification in Mato Grosso, Brazil.

Carolin Goerzig (YSSP '08 & Ludwig-Maximilians-University) studied what happens if governments decide to negotiate with terrorists and what would be the best way to negotiate with them.

Michael Hüttner (YSSP '11 & Max-Planck Institute for Biogeochemistry) modeled deforestation drivers in Papua New Guinea in order to research options for the spatial and temporal distribution of economic incentives in a scheme to reduce emissions from deforestation and degradation (REDD).

Gregor Kiesewetter (YSSP '09 & University of Bremen) assessed the Influence of the North Atlantic Oscillation on pollution transport to and within Europe and the Arctic, and how this can be integrated into IIASA's GAINS model.

Elke Loichinger (YSSP '09 & Max-Planck Institute for Demographic Research) quantified the possible effects of population aging on labor supply and human capital investment.

Thi Luu (YSSP '14 & Kiel University) will use various modeling approaches to research the interrelations between the financial sector and the macro-economy.

Yolanda Cristina Lopez Maldonado (YSSP '15 & Ludwig-Maximilians-University) used material-flow analysis to identify the human drivers affecting groundwater system of Yucatan, Mexico.

Goran Mihelcic (YSSP '10 & University of the Federal Armed Forces, Munich) studied decision support tools to help in the management and protection of critical infrastructure in the event of an extreme event.

Jan Ohlberger (YSSP '08 & Leibniz-Institute of Freshwater Ecology and Inland Fisheries) developed a model of the ecological diversification of Coregonid fish as a first step towards...
understanding the adaptive speciation of fish populations along the environmental gradient of water temperature.

**Prajal Pradhan** (YSSP '13 & Potsdam Institute for Climate Impact Research) studied the pathways to increase crop yields including what anthropogenic inputs will be needed and what environmental stresses will be caused by increasing this agricultural productivity.

**Lucia Maria Seebach** (YSSP ’11 & University of Copenhagen), a German national, improved the mapping of forest resources (biomass and biodiversity) by evaluating the influence of input data quality on the uncertainty of forest resource model outputs.

**Yvonne Scholz** (YSSP ’08 & Institute of Energy Economics) completed an inventory of renewable electricity generation potentials for a new model that analyzes low cost electricity supply in Europe with high shares of renewable energies.

**Stefan Schreier** (YSSP ’12 & University of Bremen) estimated nitrogen emissions from wild fires in northern Eurasia for 2001 to 2010. (Funded by Austrian NMO)

**Mehdi Ghodrati Shojaei** (YSSP ’15 & Alfred Wegener Institute for Polar and Marine Research) used biological trait analysis to explore the ecological functioning of species living in or on the seabed and to compare functional diversity across different species. (Funded by IIASA)

**Markus Tum** (YSSP ’10 & German Aerospace Center) improved estimates of carbon fixation by agricultural, forest or grassland vegetation with two different modeling approaches for a range of case studies including selected farms, single fields, and defined forest and grassland areas.

**Susanne Wagner** (YSSP ’08 & Stuttgart University) explored the implications of New EU Legislation on the emissions of air pollutants and greenhouse gases from agriculture.

**Johanna Wehkamp** (YSSP ’15 & Mercator Research Institute on Global Commons and Climate Change) explored if weak institutions drive deforestation by identifying relevant governance indicators for global forest modeling.

### Sponsoring Students from the Developing World

The following doctoral students have also been generously sponsored by IIASA’s German National Member Organization to participate in the YSSP since 2008:

**Ali Seyed Kharazzi** (YSSP’12 & from Iran) explored whether and why the sustainability of economic networks tends to be more dependent upon the resiliency or the efficiency of the network.

**Tuyen van Nguyen** (YSSP’11 & from Vietnam) used an eco-evolutionary model to analyze how certain aquatic organisms respond to external environmental disturbances such as oxygen, temperature, and pollution.

**Arame Tall** (YSSP ’10 & from Senegal) researched how farmers could use climate and weather forecasts to reduce their vulnerability to hydro-meteorological disasters.

### Special Awards

Young scholars studying in Germany have been recipients of the annual YSSP Pececi and Mikhailevich Awards, which reward the YSSP participants whose research papers have met standards of the highest quality, originality and relevance of research. The winners receive a scholarship to return to research at IIASA.

In 2012, **Stefan Schreier** (University of Bremen) won the Pececi award for his paper "Estimates of Forest Fire Nitrogen Oxides Emissions in Russia between 1998 and 2010". Three years earlier, **Gregor Kiesewetter** (University of Bremen) won the same award for his work on assessing transport of particulate matter pollution from Europe to the Arctic. And in 2008 **Jan Ohlberger** (Leibniz-Institute of Freshwater Ecology and Inland Fisheries) received the Mikhailevich award for his model-based research on how temperature gradients in a lake can affect fish evolution.
Regional Young Scientists Summer Program

In 2012 IIASA launched its first expansion of the successful YSSP with the Southern African Young Scientists Summer Program (SA-YSSP) at the University of the Free State in Bloemfontein, South Africa. The Program is organized jointly by IIASA and three South African partners: the National Research Foundation, the Department of Science and Technology, and the University of the Free State. In a competitive selection process, three doctoral students who were German or studying in Germany were awarded fellowships to take part in the program:

- **Noor Jamal** (SA-YSSP 2013-14 & University of Flensburg) conducted a techno, economic, and environmental analysis of electrification options in remote and rural areas of South Africa.
- **Emnet Tadesse Woldegiorgis** (SA-YSSP 2013-14 & University of Bayreuth) analyzed regional higher education reform initiatives in Africa.
- **Verena Helen van Zyl-Bulitta** (SA-YSSP 2012-13 & University of Leipzig/University of Stellenbosch) investigated negative externalities of adaptation plans on a conceptual level in the African context through direct engagement with stakeholders in in-depth interviews.

Prospects for Future IIASA-German Activities

This Info Sheet summarizes recent research collaborations between IIASA and Germany (see pages 7 to 15). Significant potential remains to further intensify the IIASA-German relationship through developing a range of new joint activities including:

- **Enhancing German expertise in applying system analysis to national problems:** Developing bespoke German versions of IIASA’s global models would allow researchers and policymakers to look at complex global problems and their impact on Germany in a holistic and integrated way. For example, the Dutch government worked with IIASA to develop a Dutch version of the IIASA GAINS model. The new model helps ministries to identify cost-effective measures to improve air quality and reduce greenhouse gas emissions in the Netherlands at the same time as complying with the country’s obligations under European air quality agreements.

- **Conducting international assessments in areas of German strategic interest:** Germany was a significant contributor to IIASA’s Global Energy Assessment which brought together over 500 specialists to transform the way society thinks about, uses, and delivers energy. IIASA is embarking on three new assessments, at the request of its member countries that will focus on issues of strategic interest to Germany. These are holistic, integrative assessments of plausible futures for the Arctic, global water challenges, and tropical forests.

- **New partnerships between IIASA and German institutions to win grants from international research funders:** IIASA’s high-quality research and international research network makes it highly competitive in its applications for international research funds. Between 2006 and 2013, IIASA almost doubled its income by winning research grants that amounted to €62 million—36% of which funded projects that included partners from Germany. This was part of a total funding portfolio of €308.5 million of the external projects in which IIASA was and is involved. Looking forward, the potential for intensifying collaboration between IIASA and German partners on the new EU research funding program, Horizon 2020, is high.

- **Using international scientific cooperation to support diplomacy:** IIASA was established in 1972 to use scientific cooperation to build bridges across the Cold War divide and research growing global problems on a truly international scale. Today the soft power of science diplomacy continues to help IIASA’s member countries through using scientific cooperation to improve international relations, and through international teams jointly researching controversial issues to find consensus, free from the constraints of national self-interest (see box: Research to support science diplomacy: page 9). Recently, IIASA has launched a new international project to analyze the prospects for economic integration between Europe and the countries of the former USSR.

- **Academic training opportunities for young German scientists:** There is significant potential to enhance participation by young German postdoctoral students in IIASA’s programs to develop international and interdisciplinary research skills (see page 16: Capacity Building). For example, by becoming a partner in IIASA’s forthcoming International Postgraduate School of Excellence.
Several IIASA researchers hold positions at universities and other institutions in Germany. These include Sabine Fuss (Mercator Research Institute on Global Commons and Climate Change); Joanne Linnerooth-Bayer (Munich Climate Insurance Initiative); Wolfgang Lutz (member, German Academy of Sciences Leopoldina; foundation board member, Berlin Institute for Population and Development); Nebojsa Nakicenovic (member, German Advisory Council on Global Change; member, International Advisory Board, Helmholtz Programme on Technology); Tapio Palokangas, (member, Academic Council of the DEGIT Virtual Research Center, Kiel); Frans Willekens (Max Planck Institute for Demographic Research).

IIASA researchers have also made numerous presentations in Germany, a recent selection follows:

- **Florian Kraxner** on "Achieving Zero Net Deforestation and Concurring Goals in Bioenergy and Biodiversity Conservation" at a MCC forestry workshop on ‘Reconceiving Forest Governance: The Example of the German Forest’ in Berlin in 2013.


- **Wolfgang Lutz** on “Investment in Human Capital: From Quantity to Quality” at the first Circular European Academies Conference in Halle in 2013.

- **Nebojsa Nakicenovic** on “Transforming Energy Systems: Energiewende as a Role Model?” at the German Development Institute’s and UN Sustainable Development Solutions Network’s event on ‘New Pathways towards Global Sustainability’ in Baden-Württemberg in 2013.


- **Elena Rovenskaya** on “Balancing Ecology and Economy in Forestry” at a workshop on ‘Renewable Resources, Sustainability, and Search’ in Heidelberg in 2013.


- **Michelle van Vliet** on “Cross-sectoral Conflicts for Water under Climate Change: The Need to include Water Quality Impacts” at the International Conference on Climate Change Effects in Potsdam in 2013.


Other examples of scientific exchange include:

- 886 publications have resulted from IIASA-German collaborations since 2008.
- On average 25 German nationals have been employed by IIASA every year since 2008.
- Since 2008, 24 doctoral students from Germany or studying in Germany have gained international and interdisciplinary research experience from participating in IIASA’s Young Scientists Summer Program.
- Over 150 researchers, advisors, and diplomats from Germany have visited IIASA and over 450 Germans have participated in IIASA events since 2008.
- IIASA scientists have visited Germany over 300 times.

**Appendices**

The details behind the above facts can be found in the following appendices to the country sheet. The appendices are either attached or available on request from Tom Danaher (danaher@iiasa.ac.at):

2. Conference participants from Germany to IIASA (2008-2015)
3. Travel by IIASA scientists to Germany (2006-2014)
5. Members of the German National Member Organization: Association for the Advancement of IIASA
About IIASA

Founded in 1972, the International Institute for Applied Systems Analysis (IIASA) conducts policy-oriented research into problems of a global nature that are too large or too complex to be solved by a single country or academic discipline. IIASA research is across and at the intersection of natural, human, social, knowledge and technology systems to support the development of integrated solutions to global sustainability challenges.

IIASA is at the center of a global research network of around 3,500 scholars and over 700 partner institutions in over 65 countries. It is funded and supported by its National Member Organizations which represent the scholarly community in the following countries:

Australia, Austria, Brazil, China, Egypt, Finland, Germany, India, Indonesia, Iran, Malaysia, Japan, Netherlands, Norway, Pakistan (Observer), Republic of Korea, Russia, South Africa, Sweden, Ukraine, United Kingdom, United States of America, Vietnam.

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