POLICY

France prepares first national research strategy

Plan promises funding stability and better career prospects for young scientists.

BY BARBARA CASASSUS

France is getting ready to create a national, multi-year research plan for the first time — a move warmly welcomed by the country's major research agencies.

The details of the programme, unveiled by Prime Minister Édouard Philippe in Paris on 1 February, are yet to be defined, but the government says that it will protect research funding, boost the recruitment of early-career scientists and help France to stand out in an increasingly competitive global research landscape.

The programme should cut bureaucracy and give scientists more resources, allowing them to plan more effectively for the future and freeing more time for research, said Phillippe.

Fourteen chiefs of public research agencies, including the national fundamental-science agency, the CNRS, welcomed the move in a joint statement. It "is an opportunity to ensure that France remains a major scientific country" at a time of intense international competition — particularly from Asia, the leaders said.

Scientists in France have long complained that their research budgets fluctuate with political administrations — something that the strategy aims to address.

Publicly funded research in France is conducted mostly in university-affiliated labs run by agencies such as the CNRS and field-specific bodies — for example, INSERM for biomedical science. Each receives a portion of the central research budget, about €8.8 billion (US$9.9 billion) for 2019.

French Prime Minister Édouard Philippe.

XAVIER PIERRE/CNRS

Last July, a parliamentary fact-finding mission backed the idea of a national research plan. Scientists, research leaders and members of parliament are currently advising on the programme, which will be modelled on a national defence strategy; working groups will look at funding, human resources to improve science-career prospects for young scientists, and links between the public and private sectors to boost innovation.

The government intends to introduce the plan in a law expected to pass by 2021. Its details are still flexible, an adviser to the research minister told a press briefing — but it will cover at least three years and could coincide with the European Union's next major research-funding programme, Horizon Europe, for 2021–27. The adviser said that the plan would also raise the research budget.

Reactions from the broader research community have been mixed. "I look forward to seeing the details, particularly the size of the budget and the policy on recruiting young scientists," says Frédéric Dardel, president of Paris Descartes University. He adds that because the long-term programme should be in place before the presidential elections in 2022, it will help to stabilize research policy and funding, regardless of who wins.

Some have taken a dimmer view. "We have been asking for a multi-year investment plan for more than 15 years, with an increase of €1 billion a year over 10 years," says Patrick Monfort, secretary-general of the French National Trade Union of Scientific Researchers. "The three areas that will be discussed are important, but there is no official mention in the announcement of increasing the budget," he says. ■

EUROPE'S MEGA-PROJECTS

Six teams vie for billion-euro funding

AI and virtual time-machine projects are among those hoping to become giant European Union science initiatives.

BY ALISON ABBOTT

The European Commission has selected six research projects — in areas from health and energy to artificial intelligence (AI) and cultural heritage — to compete to become one of its next billion-euro 'flagship' science initiatives, *Nature* has learnt.

The commission chose the 6 candidates in December from a list of 16 proposals, say scientists on the shortlisted teams. On 1 March, each team will receive €1 million (US$1.1 million) to develop a detailed feasibility proposal over the next year. Up to three will be chosen to become full initiatives to launch in 2021.

The commission already supports three scientific mega-projects, known as Future and Emerging Technology (FET) Flagships — on the brain, graphene and quantum technologies — which are each funded to the tune of around €1 billion over 10 years. The high-profile projects aim to make paradigm-shifting advances in their fields by bringing together expertise and funding from scores of academic and industrial sources across Europe.

The six newly shortlisted initiatives are: a project that would explore how AI can enhance human capabilities; one to hasten the clinical availability of cell and gene therapies; a personalized-medicine initiative; two projects that aim to improve the efficiency of solar-energy technologies; and a humanities project called the Time Machine, which seeks to develop methods for enabling digital searches of historical records in European cities.

The Time Machine's selection was a welcome

surprise, says Frédéric Kaplan, a computer scientist at the Swiss Federal Institute of Technology in Lausanne and co-principal investigator on the project, which has already worked on historical records in Venice, Italy. "As a project in cultural heritage, we were an outsider — it is a great victory to get this far," says Kaplan.

The commission launched the original flagships in 2013 under its FET programme, which is part of the European Union's main Horizon 2020 research-funding scheme. The FET Flagships were designed to tackle major scientific and technological challenges and to contribute to societal and economic well-being in Europe. The commission stumps up half of the €1 billion for each and expects the project consortia to raise the rest.

The Human Brain Project and the Graphene Flagship launched first, after a call for proposals, and the commission added the Quantum Technologies project in 2017. Another flagship, on battery technologies, is under discussion.

Although based on the same principle as these initiatives, the structure and funding of future projects is likely to change — but it's not yet clear how. Similar large-scale research initiatives are likely to be included in Horizon 2020's successor, Horizon Europe, which will start in 2021 and end in 2027. The commission said that it could not yet provide detail on how "flagship-like" missions will work within Horizon Europe, because it is still in the early phases of design.

"The approach is quite different, and there isn't yet much clarity about how things will come together," says cell biologist Daniela Corda, director of the CNR Institute for Protein Biochemistry in Naples, Italy, and Italian delegate to the Horizon 2020 programme committee. ■

ATMOSPHERIC SCIENCE

Tropical Africa could be key to solving methane mystery

Wetlands are a likely culprit for a spike in atmospheric concentrations of the greenhouse gas.

BY JEFF TOLLEFSON

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Microbes in Africa's tropical wetlands could be pumping large amounts of methane into the atmosphere.

UK scientists have taken the most detailed measurements yet of the methane in the skies over tropical Africa. The data should help researchers to understand a mysterious spike in atmospheric concentrations of the powerful greenhouse gas, which began in 2007.

An aeroplane loaded with sampling equipment began flights in Uganda in January and ended last week in Zambia. Researchers sampled methane emissions emanating from papyrus swamps, burning farm fields and flatulent livestock. Early results confirm that Africa is playing a major, yet poorly documented, part in the global methane cycle, with enormous consequences for the global climate.

Between dodging thunderstorms, the team found massive methane plumes rising above wetlands in both Uganda and Zambia. Researchers targeted this particular habitat because previous studies[1] suggested that wetland microbes might be responsible for the methane spike. Project scientists were also able to measure the methane contained in smoke plumes emanating from agricultural fires around Lake Victoria and in northern Uganda.

"We've already learned a lot," says Euan Nisbet, an Earth scientist at Royal Holloway, University of London in Egham, who leads a consortium of 17 research institutions involved in the campaigns. In 2016, with £5 million (US$6.5 million) in core funding from the UK Natural Environment Research Council in Swindon, the consortium started fieldwork in Africa and elsewhere, in addition to computer modelling work, to try to understand what is driving the global methane increase. The project is scheduled to wrap up in 2020.

Instruments on the plane that the team flew over Uganda and Zambia collected data on the stew of gases and pollutants in the atmosphere. But the key to solving the methane mystery might be in the air samples that Nisbet's team gathered. The researchers returned to Britain last week with hundreds of flasks and plastic bags filled with the samples taken from the aircraft and by teams on the ground.

Nisbet and his colleagues will be looking at the isotopic signature of the methane emissions contained in their samples. Bacteria that consume carbon and produce methane in wetlands, for instance, tend to take up more of the isotope carbon-12. Fossil-fuel operations tend to release methane that contains more of the heavier carbon-13 isotope. Methane produced in a fire falls somewhere in between.

Scientists plug these chemical fingerprints into computer models to analyse the global methane trends documented at dozens of air-sampling sites around the world. But data from the tropics, and from Africa in particular, is sparse, says Nisbet. ▶