



Final Statement of the Workshop on Climate Change, Health of the Planet and Future of Humanity

Scientific results and future scenarios anticipating COP24 in Katowice in December 2018



“If you do not change direction, you will end up where you are heading.”

Laozi

In preparation of the COP 24 UN Climate Summit in Katowice (Poland, December 2018), this joint meeting of the Pontifical Academy of Sciences (PAS) and the Consiglio Nazionale delle Ricerche (CNR) sets the ground for an urgent and unified call toward immediate and strong actions to fight global warming. Distinguished scientists from both institutions and invited experts shared their insights on climate change and proposed key measures to protect the health of the planet and the future of humanity.

Three years after the landmark Paris Agreement was signed, CO₂ emissions continue to rise and the impacts of climate change are taking a growing toll on societies and ecosystems across the globe. The scientific community has deeply investigated the causes and consequences of climate change, from its primary drivers, anthropogenic greenhouse gas emissions, to impacts such as sea level rise, extreme weather events like heat waves, desertification, and biodiversity loss. Collectively, these impacts are undermining the sustainability of life on Earth, and they pose a serious risk to human wellbeing and even survival [1].

Cognizant of these threats, Pope Francis appeals in his encyclical “Laudato Si” [2], to reverse this “failure of conscience and responsibility”. Calling on humankind to reduce greenhouse gas

emissions, he observes that we have never “so hurt and mistreated our common home as we have in the last two hundred years”. The United Nations Sustainable Development Goals [3] echo this holistic view on ecological and social justice and serve as a global road map for an equitable and sustainable use of resources. Their implementation would mitigate climate change, while combating hunger and poverty around the globe.

Despite these prominent calls to action, the political response has fallen deplorably short of scientific recommendations to act and especially protect people and regions at risk. To guide urgent political action, research increasingly focusses on deciphering local climate impacts. Even in a 2°C world, vulnerable regions, such as the Arctic, the African continent or the Eastern Mediterranean-Middle East, face distinct and dire consequences. Across the planet, climate change-driven pressures are beginning to intensify human suffering through famine, large migrations and even conflicts and wars. Research, innovation and implementation of measures to reduce greenhouse gas emissions are clearly lagging behind the required commitment to protect planetary and human health in the long run.

The IPCC Special Report on 1.5°C[4] spells out the challenge before us: we need to reduce emissions by 45% by 2030 and decarbonize the entire global economy by 2050. The Great Transformation needed for this task requires firm and non-deferrable emissions reductions starting today. Hereby, easy and obvious solutions, ‘the low hanging fruits’, need to be implemented immediately across scales and sectors. These include increasing energy efficiency, accelerating renewable energy production, fostering behavioral change towards sustainable and healthy lifestyles, as well as better resource use – for example in food systems – across the entire value chain.

Further, we need to switch from a vision of Industry 4.0 towards a practice of *Nature 4.0*. This entails rediscovering the ingenious and often simple solutions offered by nature, in particular valorizing the power of photosynthesis as carbon dioxide sink, and combining them with the most advanced and visionary technology we have at our disposal. This switch to *Nature 4.0* should entail key re-discoveries and innovations. For example, as stressed by the speakers, the renaissance of wood as sophisticated building material or of water pumps as means for effective energy storage, the application of machine learning to the production process of bioplastics, or the employment of biophotonics as a scalable substitute to antibiotics in food production. The list could go on. At a planetary scale, this smart combination of nature and technology is quintessential to providing solutions for a bio-based and carbon-neutral economy that limits global warming “to well below 2°C”.

Cities ought to drive this decarbonization by *Nature 4.0*. As growing hotspots of greenhouse gas emissions, resources use and vulnerability, they also concentrate transformative and innovative potential. Of course, the success of *Nature 4.0* solutions also depends on a resilient re-integration of rural and urban spaces, and a fair and meaningful inclusion of stakeholders within this Great

Transformation. Scientific academies have an important role to play in this endeavor, as they provide extensive educational and networking opportunities and foster mission-driven innovation and international exchange for the future of humanity.

To accelerate the implementation of decarbonization solutions, the Pontifical Academy of Sciences and the Consiglio Nazionale delle Ricerche suggest that distinct regions should be chosen on a competitive basis as ***Transition Super-Labs***. These regions would demonstrate, as real-life laboratories, that a great transformation towards sustainability can be realized, that stakeholders can be integrated, and that capacity building and education for sustainable innovation across sectors can be achieved. For conversion regions, in particular coal and lignite-producing regions, these *Transition Super-Labs* are a key opportunity to accelerate a just transformation towards sustainability with the required focus and financial support.

His Holiness Pope Francis expressed the hope that “humanity still has the ability to work together in building our common home”. We are indeed the last generation that can limit global warming before it causes irreversible negative changes to our planet. Time is almost over and action must be taken immediately, by all, worldwide.

“Everything seems impossible, until it is done”

Nelson Mandela

[1] Rockström, J., Gaffney, O., Rogelj, J., Meinshausen, M., Nakicenovic, N. and Schellnhuber, H.J. (2017): A roadmap for rapid decarbonization. *Science* 355 (6331), 1269-1271.

[2] Holy Father Francis (2015): Encyclical Letter [*Laudato Si'*](#) on Care for our Common Home.

[3] [The United Nations Sustainable Development Goals](#) (2015).

[4] Intergovernmental Panel on Climate Change (IPCC) (2018) *Special Report on Global Warming of 1.5°C*, Incheon, South Korea.

Signatories

PAS President Joachim von Braun

CNR President Massimo Inguscio

PAS Chancellor Marcelo Sánchez Sorondo

Vanderlei Bagnato

Steven Chu

Fausto Guzzetti

Mohamed Hassan

Zbigniew Kundzewicz

Francesco Loreto

Costas Papanicolas

Martin Rees

Angelo Riccaboni

Pawel Rowinski

Jeffrey Sachs

Hans Joachim Schellnhuber

Riccardo Valentini

Peter Wadhams

Roberto Williams