

*Taiwan and EU Strategies Against Climate Change  
– Main Topics for International Education*

Huai-che Lu, Wenzao Ursuline University of Languages, Taiwan  
Reinhard Zeitler, Independent Scholar, Germany

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**Abstract**

The 6th report of the Intergovernmental Panel on Climate Change (IPCC) presents detailed knowledge about climate change and calls for more immediate actions to reduce risk and increase resilience. We provide an overview of the climate adaptation and mitigation strategy of Taiwan and the European Union (EU) including the general framework, individual programs, their achievements and concerns. In Taiwan, the government introduced the National Climate Change Adaptation Policy Guidelines and the Taiwan Climate Change Projection Information and Adaptation Knowledge Platform (TCCIP) to implement and research adaptation solutions. Climate action is at the heart of the European Green Deal which is an ambitious package of measures to drastically reduce greenhouse gas emissions, investing massively in research and innovation. Starting with the new Commission in 2019, the EU developed a massive wave of new initiatives for climate actions. One of these actions is the European Climate Law with a legally binding target of net zero greenhouse gas emissions by 2050. In the discussion, we also examine the challenges of public visibility and media attention on climate issues. As numerous scientific findings were presented to the world community, now all eyes are directed to COP 27 held in Egypt. As the pandemic absorbed much of the workforces of governments in Europe as well as in Asia, we ask: How are Taiwan and the EU dealing with this?

Keywords: Climate Change, Climate Change Adaptation, European Union, IPCC, Taiwan

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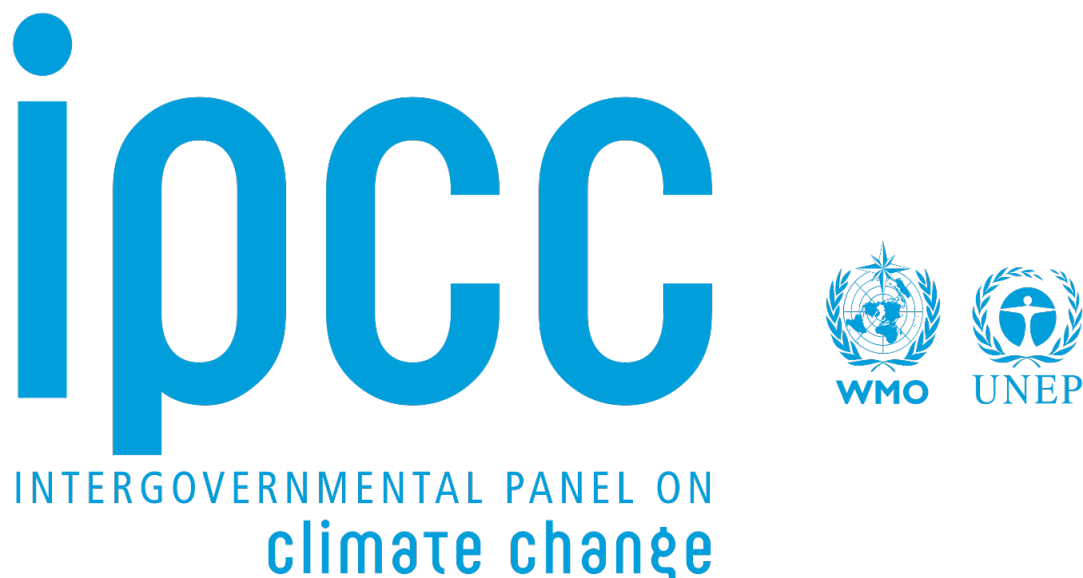
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## Introduction

After the approval by all 195 members of the Intergovernmental Panel on Climate Change (IPCC), a Working Group II report about the impact of climate change was published in February 2022 (Pörtner et al., 2022b). ‘This report is a dire warning about the consequences of inaction,’ said Hoesung Lee, Chair of the IPCC (IPCC, 2022). ‘It shows that climate change is a grave and mounting threat to our wellbeing and the planet. Our actions today will shape how people adapt and how nature responds to increasing climate risks (IPCC, 2022).’ In this article, we focus on the contents of the WG II report and aspects related to Taiwan and the European Union (EU). Building on the findings, we also provide an overview of Taiwan’s and the EU’s strategies against climate change and evaluate their achievements and challenges.

## Intergovernmental Panel on Climate Change (IPCC)



[Logo of the IPCC]. (n.d.).

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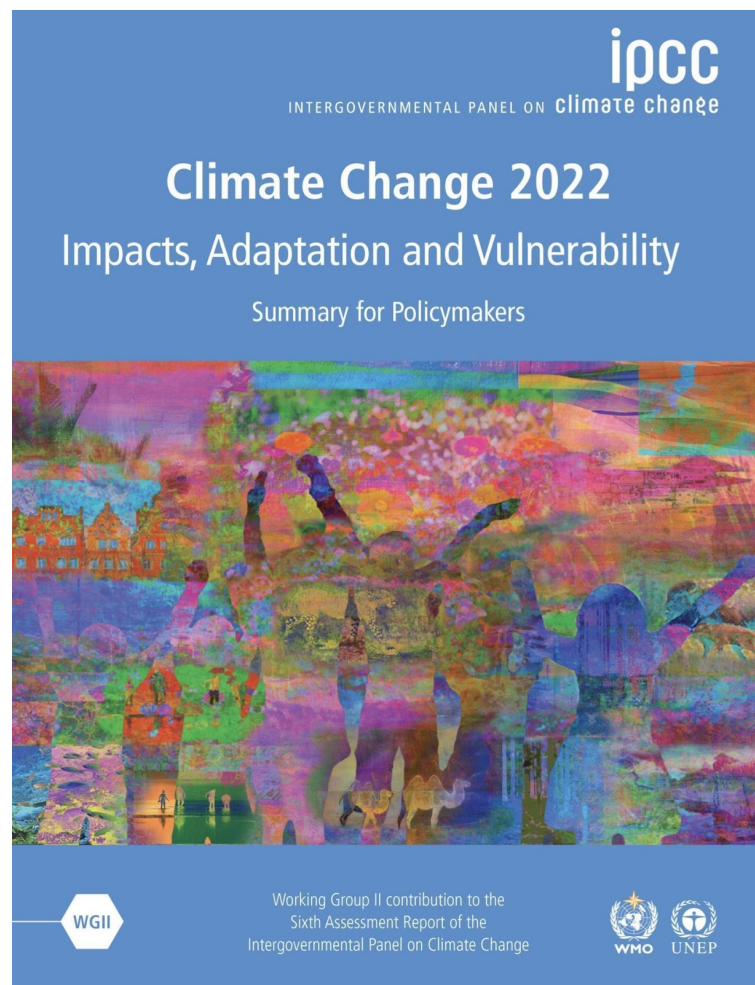
Figure 1: Logo of IPCC

In 1988 the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) established the Intergovernmental Panel on Climate Change (IPCC). It is a UN body that assesses scientific knowledge related to climate change and regularly informs politics about its scientific assessments of implications, risks and strategies for adaptation and mitigation. To fulfill its tasks IPCC is supported by three Working Groups: WG I clarifies the physical science basis of climate change, WG II is concerned with impacts, adaptation and vulnerability and WG III with the mitigation of climate change. A Task Force on National Greenhouse Gas Inventories develops methodologies for monitoring emissions. Governments use the IPCC assessments to develop climate policies and these assessments are of great importance for international negotiations to combat climate change. To reach most high standards of objectivity and transparency reports are drafted and reviewed in several stages, which takes years of scientific considerations. The final IPCC assessment report consists of the contributions of the three Working Groups and a Synthesis Report.

## Working Group II contribution to the Sixth Assessment Report

It is the task of WG II of the IPCC to assess the impacts of climate change. It looks at ecosystems, biodiversity, and human communities at global and regional levels. It reviews the vulnerabilities, capacities and limits of the natural world and assess how human societies adapt to climate change. The Summary for Policymakers of the IPCC WG II Report, *Climate Change 2022: Impacts, Adaptation and Vulnerability* was released on 28th of February 2022 after approval by all 195 member governments of the IPCC (Pörtner et al., 2022a).

The IPCC WG II concludes that there is no region in the world that has not been impacted by climate change. Ecosystems are deteriorated, damages increase and challenges rise especially for the most vulnerable. The report states that the change is already irreversible in many cases. If the 1.5 °C level is exceeded, it will lead to the extinction of species and losses of entire ecosystems. This is especially a danger to mountain tops, coral reefs and coastal wetlands. Beyond 1.5 °C there will be more heatwaves, water scarcity, food insecurity, slides risks, diseases and increasing mental health challenges. ‘Our assessment clearly shows that tackling all these different challenges involves everyone – governments, the private sector, civil society – working together to prioritize risk reduction, as well as equity and justice, in decision-making and investment,’ said IPCC Working Group II Co-Chair Debra Roberts (IPCC, 2022).



[Cover of the WG II report]. (2022).  
<https://reliefweb.int/report/world/climate-change-2022-impacts-adaptation-and-vulnerability>

Figure 2: Cover of the WG II report

A very important conclusion of the IPCC assessment is this: adaptations implemented so far are not sufficient. The report shows significant implementation gaps. Especially the financing of the procedures does not work efficiently. Funds are rarely spent where most needed. And even when there are better adaptation measures established, their contribution to improve our situation will be limited. Adaptations cannot tackle all kind of losses and damages and can even cause new problems when their methods do not fit well with other procedures implemented to reduce climate change.

The IPCC report therefore demands stronger efforts to reach a climate-resilient world. Enhanced adaptations are necessary to reduce risks caused by climate change and find the way to a more climate-resilient development. It is crucial to reduce greenhouse gas emissions through ambitious mitigation and increase concerted efforts to achieve the Sustainable Development Goals (SDGs). Especially cities need to immediately find the way to a sustainable and resilient development. Future options of a beyond-1.5 °C-degree scenario are very challenging, but may simply not be possible if we exceed 2 °C. The science is clear. But it is also clear that international cooperation, political will and scaled-up investment are necessary. ‘The scientific evidence is unequivocal: climate change is a threat to human wellbeing and the health of the planet. Any further delay in concerted global action will miss a brief and rapidly closing window to secure a liveable future,’ said Hans-Otto Pörtner, the other Co-chair of the report (IPCC, 2022).

WG II introduced several new components in its recent report: An atlas offers insights to data and findings on observed and projected climate change impacts and risks from global to regional scales. Since 2015, 270 authors from 67 countries have worked on the WG II report as coordinating authors (47), lead authors (184) or review editors (39). Additionally, 675 contributing authors were involved to check more than 34,000 references for citation and over 62,000 comments to the draft.

The WG II report is the second contribution to the Sixth Assessment Report (AR6) of IPCC. WG I released its report in August 2021: Climate Change 2021, the Physical Science Basis (Reuters, 2021). The WG III contribution followed in April 2022. IPCC announced the final Synthesis Report of the Sixth Assessment Report to be completed within the end of 2022.

## **EU and Taiwan’s strategies combating climate change**

### **Overview of climate change in Taiwan**

The 2017 Report on Climate Change by Taiwan’s Ministry of Science and Technology (now National Science and Technology Council, NSTC) revealed the extent of climate change in Taiwan and its future impact. According to the report, from 1900 to 2012, the average temperature has risen by 1.3 °C and may even rise by 3.0 to 3.6 °C above the 1986 - 2005 baseline average by the end of the century under the highest emissions scenario (RCP8.5) (Chou et al., 2017). No less expected are more polarized rainfall patterns evidenced by more frequent dry years from 1961 to 2017 and an upward trend of torrential rain occurrences.

Climate change causes a wide range of impact to the economy, environment and human well-being. Here, we provide examples of rice yield reduction, sea level rise and diseases.

Global warming intensifies rice crop’s nighttime respiration and leads to rapid loss of nutrients and reduced crop yield and weight (Peng et al., 2004), whereas increased frequency

of extreme weather events such as severe rainstorm, drought, and cold wave can inflict serious damage on rice agriculture. Long periods of rainfall can cause diseases, fruit damages and premature sprouting, while intense rain may suffocate crops. Drought is also dangerous for rice cultivation, which is among the most water-demanding agriculture. A long period of drought prior to May 2021 was responsible for over 800 million TWD agricultural loss (Wu & Chen, 2022).

From 1993 to 2003, the coastal sea level of Taiwan rose in average by 5.7mm per year, which was three times the global figure. With this pace, Taiwan's sea level will further increase by 0.40m to 0.62m, threatening coastal and lowland environments and damaging nearby fisheries (Tung et al., 2017).

The change in temperature and rainfall patterns caused by climate change greatly favors the survival of *Aedes aegypti*, a dengue fever vector mosquito, in central and eastern Taiwan. It is estimated that, by the end of the century under the highest emissions scenario, dengue fever infection may become more prevalent in these areas (Fu et al., 2020).

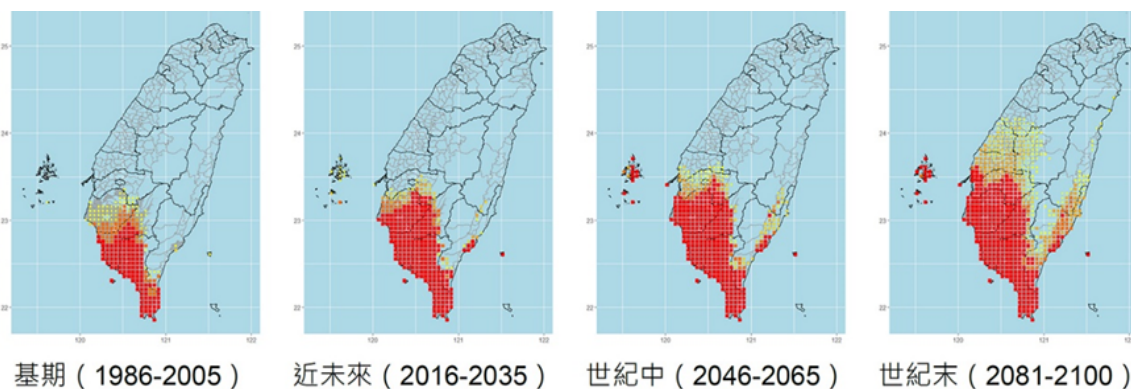


Figure 3: Future *Aedes Aegypti* distribution confidence level map under the RCP 8.5 scenario

## Taiwan's climate adaptation strategy

### National Climate Change Adaptation Policy Guidelines

In 2012, the Council for Economic Planning and Development (now National Development Council) announced the National Climate Change Adaptation Policy Guidelines as the framework for climate adaptation strategies (Council for Economic Planning And Development, 2012). The goal is to enhance adaptation capacity and address vulnerability. The guidelines list eight key adaptation areas, each with its responsible government institution and priorities. These include disasters (NSTC), critical infrastructure (Ministry of Transportation), water (Ministry of Economic Affairs), land use (Ministry of Internal Affairs), coastlines (Ministry of Internal Affairs), energy and industry (Ministry of Economic Affairs), agriculture and biodiversity (Council of Agriculture) and health (Ministry of Health and Welfare).

Though the specifics vary, the adaptation units adopt a set of common policies including risk research and assessment, risk monitoring and alert mechanisms, risk mitigation through education and staff training, risk avoidance through governance of risk areas and construction of risk preventing infrastructures, research and development of adaptive technology, natural resource protection, restoration and management, regulatory reforms and development principle in line with sustainable and adaptive development.

## **Taiwan Climate Change Projection Information and Adaptation Knowledge Platform (TCCIP)**

To plan adaptation measures, policymakers need to rely on the evidence of scientific research that assesses the trend of climate change, predicts the extent of climate change impact and identifies areas of risk. For this purpose, the National Science and Technology Center for Disaster Reduction under the National Science Council (now NSTC) launched the TCCIP project in 2009 as Taiwan's leading climate change research body (Hsu et al., 2011). Its goal was to develop an integrated platform for cross discipline climate change research and applied knowledge, apply research results on adaptation policies, assess Taiwan climate change trends and promote Taiwan climate change research. The project has now entered its fourth phase and its competences now include adaptation policy studies and knowledge brokering with industry stakeholders and the public while continuously supporting government adaptation efforts with targeted studies (TCCIP, 2022). Its aim is to expand and optimize climate science services to all social actors through more customized functions and data (Chang & Chen, 2021).

### **EU's strategy against climate change**

#### **The Green Deal of the European Union**

Starting with the new Commission in 2019 the European Union developed a massive wave of new initiatives for climate actions. One of these actions is the European Climate Law with a legally binding target of net zero greenhouse gas emissions by 2050 (European Commission, 2022b). According to this law, the EU Institutions and the Member States have to take all necessary measures to meet this target. In the first step, the net greenhouse gas emissions have to be reduced by at least 55% by 2030 compared to 1990. The EU environment ministers reached an agreement on a general approach on the Commission's proposal for a European climate law at the end of 2020, following the guidance of the European Council. After the Council and the European Parliament agreed upon the European climate law it was adopted in June 2021. With this law a European Scientific Advisory Board on Climate Change is established. It gives independent scientific advice and reports on EU climate measures. In the future, an intermediate climate target for 2040 will be developed.

The European climate law was one of the first elements established by the European Green Deal (European Commission, 2022a). Climate action is at the heart of the European Green Deal which is an ambitious package of measures to drastically reduce greenhouse gas emissions, investing massively in research and innovation while at the same time preserving the natural environment of Europe. Besides the Climate Law, the Green Deal includes the European Climate Pact to engage citizens and all parts of society in climate action, the Climate Target Plan to further reduce net greenhouse gas emissions by at least 55% by 2030 and the EU Strategy on Climate Adaptation to make Europe a climate-resilient society by 2050. To reach these goals, the European Commission adopted several detailed legislative proposals in June 2021 to revise its EU climate legislation, e.g., legislation regarding the emission trading system, the Effort Sharing Regulation and transport and land use legislation.

The Commission itself also intends to become a climate-resilient institution and employer. For this it developed an action plan which reflects the objectives of the Green Deal. It takes concrete measures across all its sites to become climate neutral by 2030. The EU was intensively engaged at the United Nations climate change conference in Glasgow (COP26). It

is determined to strengthen its role at international level to further lead negotiations regarding climate change.

## **Discussion**

### **Will the message be lost?**

A lot of scientists working in the field of climate research including those contributing to the recent reports for many years set the world society on alarm due to enormous risks arising in the future if not enough effective measures are established to battle climate change. Obviously, those in power are not acting according to the advice given by science. The reasons for this are numerous, and possibly and sadly this will be the case regarding the current reports, too. However, this time the situation could evolve even worse, since the WG II report was published during the first week when Russian troops crossed the border to Ukraine to start a brutal war mankind has not seen for many years. It is reported that the Ukrainian delegation called for news reporting on the war not to forget about the important scientific findings and connected the Russian aggression to the global dependency on oil. Oleg Anisimov, scientist and member of the Russian delegation, even apologized for the conflict (Mathiesen, 2022). But finally, it is quite clear that the gap between science and policy became wider after this war transferred our world onto another level.

This is also what Fiona Harvey wrote for *The Guardian*, ‘The Intergovernmental Panel on Climate Change warned that the dangerous impacts of climate breakdown are already being felt and are accelerating rapidly. Has that message been heard (Harvey, 2022)?’ Her conclusion is that the IPCC report will not be ignored and governments will continue working on their plans to cut greenhouse gas emissions to limit global heating to 1.5 Celsius degree above pre-industrial levels. There was great interest in what would be presented at COP 27, the next UN climate summit, at the end of 2022.

### **How are the European Governments adapting to all the crises?**

There was much enthusiasm when the new president of the EU commission Ursula von der Leyen started her presidency in December 2019. Especially promising were the announcements of the new commission to develop a new Green Deal for the European Union with powerful instruments combating climate change. Only a few months after the start of the new commission the coronavirus pandemic reached European countries and changed the whole situation. At the Franco-German Meseberg Climate Working Group in April 2020 there was still much hope to come back to the original plans, just started before together. In the common Statement on the European Green Deal and a European Recovery Plan both countries expressed to ‘shift towards rebuilding a more sustainable European economy in the medium and long term’ as soon as possible. France and Germany believed that the Green Deal provides a framework for a recovery plan aiming to stimulate the economy in a sustainable and innovative way and that it offers the opportunity for European global leadership in supporting partner countries, in particular developing countries. At this time it was agreed that climate action is a central building block of the European Green Deal with top priority. Both partners were firmly committed to fulfill the goals of the Paris Agreement and inspire other global players to raise their ambition. They welcomed the objective of a climate-neutral EU by 2050 and the proposal for the EU Climate Law that aims to fix the 2050 climate neutrality objective in the EU legislation (Gouvernement & The Federal Government, 2020).

## **What happens to the Green Deal?**

A lot of this enthusiasm has been lost since then. The challenges of the pandemic absorbed much of the workforces of the commission. And after two years combating the coronavirus suddenly a war started in Europe, most of the people hit by great surprise and in fact unprepared. After this the question arises: What happens to the Green Deal? Environment stakeholders started first to ask this question. And it is no surprise that they have the same questions as before. Regarding the recent WG II report Alex Mason, head of climate and energy at World Wildlife Fund (WWF) European Policy Office said, ‘We are fiddling around the edges while the world burns. This report shows we have the tools we need to tackle the climate crisis - but they need to be used much faster and more widely. For the EU, this means bringing its policies in line with science and making them socially fair: higher targets, ensuring polluters pay, supporting the most vulnerable and ending fake solutions like subsidising burning trees and crops for energy (WWF, 2022).’ After all it seems we lost some years combating climate change and finally will find all of us even further back where we started before the pandemic and war found its way into this world.

## **Why is Taiwan voluntarily adopting climate measures?**

In her dissertation, Milan Chen examined why Taiwan is voluntarily adopting climate measures that align with international agreements when it is excluded from participating in the UN climate regime (Chen, 2020). She also studied the basis Taiwan succeeds in passing the first climate legislation with legally binding targets in 2015. For this she conducted interviews with government officials, policymakers, and climate experts who were directly involved in the policymaking process of Taiwan. Furthermore, she analysed government records concerning the legislative details of the Greenhouse Gas Reduction and Management Act from 2006 to 2020. With all these activities Taiwan complies to the provisions of the UN climate agreements without legal responsibilities. Chen finally concludes that Taiwan primarily intends to expand its international space and to protect its export-oriented economy. She also found that concerns for climate challenges are less evident. In respect to the new scientific reports of IPCC, it seems obvious that Taiwan also took further measures to learn more about the importance of why further climate actions are reasonable and necessary.

## **How is Taiwan’s climate adaptation strategy performing?**

Taiwan’s climate adaptation efforts have yielded several achievements. First, the research into the impact of climate change on Taiwan provides valuable information about Taiwan’s climate development and the short to long term effect of climate change on Taiwan’s environmental, social and economic security, which serve as knowledge and inspiration for adaptation strategies. The data analysis and projection technology of the TCCIP enables more detailed and accurate assessment of climate change impact that suits the diverse geographic conditions of Taiwan, providing policy makers with reliable information to map high risk areas and prepare responses (Lee et al., 2022).

The legislation of the Spatial Planning Act is another important step that marks a shift of Taiwan’s development focus from economic growth to the well-being and sustainability of the society and the environment. Through categorising geographic areas according to their environmental significance and economic functions, it serves to define the different roles of each region and restrict harmful developmental practices (Chao, 2020).



Yet, Taiwan's strategy is not without shortcomings. One of the concerns is the lack of a dedicated government institution for climate adaptation. For now, policy making tasks are distributed among different existing ministries, without an overarching institution to direct these efforts. This may cause incoherence among different adaptation policies as ministries may have different priorities (Lin, 2015). Secondly, there has been no concrete and formalized procedure for the planning and review of adaptation projects, without which their effectiveness, feasibility and room for improvement will be hard to determine (Lin, 2015). Moreover, the adaptation guidelines did not promote active and sustained civil society involvement within the policy making process. Climate change brings challenges of varying scales, from the international to the local level, with each community having their own distinct environmental, social and economic adaptation concerns. The participation of local stakeholders ensures that the most important problems are addressed with adequate methods that pay attention to the distinct conditions of the specific community, whereas the results of the adaptation measures can be more closely monitored (Lin, 2015).

### **How can climate change get the awareness it deserves?**

Despite the severity of climate change impacts, current media attention remains overshadowed by other key issues like the Covid pandemic and the Ukraine war. This can be attributed to several reasons: the long term causes and consequences of climate change makes it a poor fit for the fast-pace news cycle, the negative outlook provoked by the disappointment outlook toward policy makers and private sectors leads to public indifference regarding the subject, shortage of specialized reporters to supply accurate scientific clarifications, related events mostly happen in remote places, increasing the cost of coverage, the complex nature of climate change science and solutions, and differing interest of the owners and financiers of the media (Newman, 2022).

In response to these obstacles, Newman calls for more appealing climate coverage, stressing the need to increase media's scientific knowledge, cover more aspects related to human life, and promote more positivity by reporting on ongoing and fruitful climate actions.

### **Conclusion**

As the 3rd part of the 6th AR was presented on 4th of April, UN Secretary-General António Guterres said that the report described a 'litany of broken climate promises' by policy makers and again repeated his call for more action, 'Climate activists are sometimes depicted as dangerous radicals. But, the truly dangerous radicals are the countries that are increasing the production of fossil fuels (United Nations, 2022).' After a lot of new scientific findings has been presented to the world community, now all eyes are directed to COP 27, which was held in Egypt in November 2022 (Geneva Environment Network, 2022). A big question asked by many is, how dark will the shadow of the Russian invasion of Ukraine be? Despite wars and conflicts among nations, climate negotiations have gone on for more than 30 years, insiders believe. Regarding the reports the German vice chancellor and minister for climate and economy Robert Habeck was cited with this statement, 'Fear is not a good advisor and never is. Hope is the right one' (Borenstein, 2022).

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