Reform/sc2021/033 environmental scenario analysis and climate risk assessment

Deliverable 11: Final Report

Technical Support Instrument

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List of abbreviations

CNSM – The National Committee for Macroprudential Oversight
CO_2 – Carbon Dioxide
CSRD – Corporate Sustainability Reporting Directive
EBA – European Banking Authority
ECB – European Central Bank
EFRAG – European Financial Reporting Advisory Group
ESG – Environmental, Social & Governance
ESRS – European Sustainability Reporting Standards
EU – European Union
FMA – Financial Market Authority of Austria
DG Reform – Directorate-General for Structural Reform Support, European Commission
GHG – Greenhouse Gases
ITS – Implementing Technical Standards
KPI – Key Performance Indicator
KRI – Key Risk Indicator
NACE – Nomenclature of Economic Activities
NBR – National Bank of Romania
NGFS – Network for Greening the Financial System
NFRD – Non-financial Reporting Directive
NIESR – National Institute for Economic and Social Research
RfS – Request for Service
RPA – Robotic Process Automation
SE – Supervised Entity
SME – Small and Medium-sized Enterprise
SDGs – Sustainable Development Goals
SFDR – Sustainable Finance Disclosure Regulation

1 Introduction

The scope of the Final Report of the REFORM/SC2021/033 – Environmental Scenario Analysis and Climate Risk Assessment Practices Project is to provide an overview of all Deliverables set out at the start of the Project, and to summarize the tasks, activities and implementation steps undertaken by Deloitte (the Contractor) for each Deliverable. The Report concludes with lessons learned during the implementation of the project, tailored action plans to facilitate the implementation of project results within the FMA and the NBR, and support materials for communication purposes.

1.1 Project scope overview

The **main goal of the Project** was to contribute to institutional, administrative and growth-sustaining structural reforms in Romania and Austria, in line with Article 3 of the TSI Regulation, in the area of prudential supervision of environmental and climate risks.

More specifically, the objective was to support capacity building within the FMA and the NBR by providing them a monitoring framework, an assessment of best practices and relevant data on environmental (including climate) risks. In their role of supervisory institutions, the objective was to supply them with forward-looking environmental (including climate risk) scenarios, enabling them to measure risks via Key Risk Indicators (KRIs) and Key Performance Indicators (KPIs) and develop forward-looking solutions mitigating environmental / climate risks to foster a resilient financial system.

The duration of the project spanned 20 months – from October 2021 to June 2023.

The stakeholders of the project were:

- The European Commission through the Directorate-General for Structural Reform Support (DG Reform) – the sponsor of the Project
- The Financial Market Authority of Austria (FMA) – Beneficiary of the Project
- The National Bank of Romania (NBR) – Beneficiary of the Project
- Deloitte through its Belgian, Austrian, Romanian and German teams – the contractor

The scope of work consisted in **eleven main deliverables**:

Deliverable 1

A **"Kick-off meeting and inception report"**, containing the detailed final work plan for the project, the agreed approach and methodologies. The report, based on the RfS and on the outcomes of the meetings between stakeholders of the project, ensured alignment of expectations between stakeholders in terms scope, information needs, communication channels and feedback processes.

Deliverable 2

A **"Comparative analysis report on management of environmental risks, including climate risks"**, which implied a best-practice analysis describing how other public and private institutions developed and used forward-looking scenarios, including for stress testing purposes and relevant KPIs and KRIs.

Deliverable 3

An **"Interactive conference"** consisting in a one-day event bringing together experts from public authorities whose best practices in management of environmental risks have been identified and stakeholders of the Project to foster exchange of experience and discuss possible implementing strategies.

Deliverables 4a and 4b

Developing **"Reports evaluating data gaps for Austria and Romania"** based on the results of Deliverable 2 and the work already performed by the FMA and the NBR. For the FMA, the purpose was to identify required data to develop forward-looking scenarios, KPIs and KRIs and to assess appropriate means for collecting such data. In NBR's case, the Deliverable implied developing a questionnaire addressed to financial institutions to collect qualitative and quantitative data related to ESG topics, portfolio exposures and green finance practices.

Deliverables 5a and 5b

Developing "**Reports on closing data gaps for Austria and Romania**" which, for Romania, implied describing the steps taken to conduct data gathering exercises (i.e. surveys) for non-financial entities, followed by data cleansing and analysis stages. For Austria, the Report implied describing means to close data gaps identified in Deliverable 4a by further investigating different types of data available and KPI/KRI concepts.

Deliverable 6

"**Developing monitoring frameworks for financial market supervision related to environmental, including climate risks**" for both Romania and Austria, tailoring each framework to the national context and requirements of the supervisory institutions.

Deliverable 7

"**Establishing the methodologies and developing environmental risk, including climate risk, scenarios for supervisory and financial stability purposes**" for both Romania and Austria tailoring each scenario to national decarbonisation paths and associated transition and physical risks.

Deliverables 8a and 8b

"**Capacity building for Austria and Romania**", which implied tailored workshops and support materials for integrating the results of the previous deliverables into the national supervisory and financial stability practices.

Deliverable 9

"**Feasibility assessment of digitalisation of environmental, including climate-risk analyses, KPIs, KRIs**", which evaluated the potential for automating forward-looking scenario assessments and related KRIs and KPIs for Austria and Romania.

Deliverable 10

"**Closing event**" that comprised a one-day event with Project stakeholders for discussing outputs of Deliverables 6 and 7, main lessons-learned of the project and modes of implementing follow-up measures.

Deliverable 11

"**Final report**" that captured the activities carried throughout the Project and the key outcomes and actions for implementing project recommendations. The report is accompanied by tailored communication material, a package containing all deliverables and closing meetings with the Project stakeholders.

2 Overview of tasks and delivered work

2.1 Deliverable 1 – Kick-off meeting and Inception Report

2.1.1 Deliverable 1 – Scope

Deliverable 1 was designed to introduce the stakeholders of the Project to each other, to set the scene for the Project and confirm the timeline and scope of each Deliverable as previously communicated through the Request for Service (RfS) and the contractor's offer.

The first milestone required holding a kick-off meeting between Deloitte, DG REFORM, the FMA and the NBR. The purpose of the meeting was to discuss and refine Deloitte's proposal including the detailed methodology, scope, timeline, information needs, communication arrangements and feedback-processes for the project as well as Austrian and Romanian specificities that should be considered by the contractor.

Following the kick-off meeting, the second milestone implied drafting an Inception Report that would include the methodology presented by the contractor during the kick-off meeting for Austria and Romania, as well as any agreed adjustments. The report had to cover at least the agreed details for the detailed scope, timeline, information needs, communication arrangements and feedback processes for the project.

2.1.2 Deliverable 1 – Completed tasks and work

Deloitte organised the Kick-off meeting of the project at its Vienna office on November 12th, 2021. The meeting was attended by the FMA, DG Reform and Deloitte Austria and Romania teams in physical format, whereas the NBR attended the meeting virtually (due to travel restrictions in Romania due to the Covid-19 pandemic). Prior to the meeting, Deloitte provided everyone a discussion agenda, as well as a presentation to guide the meeting discussions. The presentation included a summary of the Project goals, an overview of the Project team with a short bio of each member, aspects related to the organisation of the Project (i.e. stakeholder and governance structure, meeting arrangements, communication channels), an overview of the timeline and a detailed view of each Deliverable. Following the meeting, Deloitte circulated meeting minutes with all stakeholders, also containing amendments to the Project approach that were discussed in the Kick-off meeting.

A first version of the Inception Report developed shortly after the Kick-off meeting, based on the same structure of the Kick-off presentation and on the offer submitted by Deloitte in response to the Request for Service. The Report also included required amendments to the methodology as discussed in the Kick-off meeting. After prolonged discussions between the contractor and the beneficiaries related to Deliverables 6 and 7, the Inception Report was ultimately approved on August 08th, 2022. However, this did not affect the initially agreed timeline of the Project or completing the tasks of prior deliverables.

Please refer to "Annex A – Deliverable 1 – Kick-off meeting and Inception Report" for the associated materials.

2.2 Deliverable 2 – Comparative Analysis Report on Management of environmental risks, including climate risks

2.2.1 Deliverable 2 – Scope

Deloitte was tasked with performing a stock-take of current practices regarding the management of environmental risks, including climate risks. In particular, Deloitte had to assess the use and development of forward-looking scenarios which could form a basis of strategic decision making, as well as a starting point for stress testing exercises, KPIs and KRIs. The analysis had to take into account (at a minimum) the work done by the Network for Greening the Financial System (NGFS), the European Banking Authority (EBA) action plan on sustainable finance and the EBA's risk assessment of the European Banking System (December 2020), the practices of Banque de France/ Autorité de contrôle prudentiel et de resolution (ACPR), De Nederlandsche Bank/ Autoriteit Financiële Markten (AFM) and Bank of England/ Financial Conduct Authority (FCA), Deutsche Bundesbank/ Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin), the European Central Bank (ECB)/Single Supervisory Mechanism (SSM) as well as the practice of a large, international insurance or re-insurance company.

The analysis was required to be drafted as a "best-practice report", describing how other institutions developed and the use of forward-looking scenarios addressing environmental risks, including climate risks, related KPIs and KRIs by financial sector supervisors including central banks entrusted with financial sector supervision.

2.2.2 Deliverable 2 – Completed tasks and work

The work performed for the comparative analysis followed a two-step approach: a preliminary comparative analysis comprised of reviewing the publications of 26 entities agreed with the beneficiaries, and an interview stage where 20 entities were further selected for 1-to-1 discussions on details of their sustainable finance supervision framework, out of which 13 entities ultimately agreed to participate in interviews.

For the preliminary analysis, relevant available publications and reports of selected entities were identified, centralized and examined. The analysis initially focused on European counterparties of the beneficiaries which already displayed meaningful progress in the field of environmental and climate risk assessment. Then, the list of entities was extended towards European supervisory authorities, which through their role and policy-making functions directly influence the sub-sectors of the financial industry. Additionally, several German-Austrian insurance and re-insurance companies were included, which were mostly relevant to the FMA's area of supervision. Furthermore, the preliminary analysis was extended towards supervisory authorities in North America, Asia and Australia with the objective of providing a global perspective to the analysis of best practices. The list of 26 selected entities was also validated by the FMA and the NBR: 10 regulators, 7 central banks / regulators, 5 co-op associations as well as 4 insurance and reinsurance companies.

The preliminary analysis focused on summarizing the content of each identified publication to obtain the needed information to conduct in a second step a comprehensive benchmark analysis. Approximately 100 publications were investigated on topics related to:

- Information about climate and environmental related KPIs and KRIs: metrics were split into financial and non-financial KPIs and KRIs. Among the relevant financial KPIs, there are those in relation to credit risk, market risk, liquidity risk and underwriting risk. The non-financial KPIs capture operational, reputational and litigation risks;

- Gaining an overview of the climate and environmental scenarios used: the scenarios were split into two main categories – climate risk, with the subcategories transition and physical risk, and environmental risk, with the subcategories pandemic risk and biodiversity loss;
- Information regarding practices for climate stress testing used by selected entities, namely used scenarios, type of stress-test, risk type coverage and time horizons.

The interview stage selected entities researched in the preliminary analysis with the most relevant publications concerning climate and environmental risk practices. The final sample of entities for the interview stage included 7 regulators, 6 central banks / regulators, 3 co-op associations as well as 4 insurance and reinsurance companies. 13 of the 20 entities were ultimately willing to hold interviews with Deloitte and the beneficiaries. The 13 interviewed entities were: Banque de France (BdF), the NGFS (covered during BdF interview), the European Banking Authority (EBA), De Nederlandsche Bank (DNB), Deutsche Bundesbank, BaFin, the European Insurance and Occupational Pensions Authority (EIOPA), Bank of Italy, the European Securities and Markets Authority (ESMA), VIG & VIG RE, Uniqa, Munich RE and Allianz. For each interview, a detailed questionnaire – the interview guide – was prepared based on information gathered in the preliminary analysis. The purpose was to structure entities' inputs in a similar way to the preliminary analysis and to develop in-depth knowledge over their particular methodology and processes. The interviews were carried out between February and April 2022.

The results of the preliminary analysis and the interview stage were included in the "best practices report" which aimed at providing a holistic overview of the scenarios and approaches used by observed financial institutions (central banks, supervisory authorities and regulators), which form the basis of this report, having already touched upon the assessment of climate and environmental risks. The report included chapters detailing the frameworks for evaluating climate and environmental risks, climate and environmental scenarios put into practice, key performance and risk indicators, climate stress testing methodology and conclusions.

Please refer to "Annex B – Deliverable 2 – Comparative Analysis Report on Management of environmental risks, including climate risks" for the associated materials.

2.3 Deliverable 3 – Interactive conference

2.3.1 Deliverable 3 – Scope

The goal of the interactive conference was to foster mutual learning and strengthen working relationships between the parties involved in the projects; furthermore it aimed at raising the public profile of the project.

Deloitte was tasked with organising a one-day conference with experts from the public authorities contributing to the study as identified and agreed under Deliverable 2, DG REFORM and representatives of the FMA and the NBR. The event had to be organised such that it covered the results of the comparative analysis, gathered feedback and answer questions, fostered exchange of experience.

The exact format, agenda, speakers and participants of the conference had to be agreed with DG REFORM taking into account the view of the FMA and the NBR. The conference was required to be organised either in Vienna or Bucharest at the premises of FMA or NBR, unless COVID restrictions prevented it, in which case the conference had to be organised online.

The event had to be structured to contain a non-public part for technical experts and mid-management of FMA and NBR, and a public part as a high-level panel discussion with guest speakers. The public panel had to be web-streamed in order to be made available to a broader audience. Support materials had to be prepared and pre-approved with the stakeholders prior to the event.

Ultimately, a summarizing report was required, to include the main findings, lessons learned and feedback from the participants.

2.3.2 Deliverable 3 – Completed tasks and work

Deloitte proceeded with organizing the interactive conference, with the main goal of presenting the outcomes of Deliverable 2, i.e. a Comparative Analysis on climate and environmental risk management of other regional and global entities; furthermore, it aimed at fostering communication and knowledge exchange between the stakeholders and guest speakers identified as experts in climate and environmental risks assessment for the finance sector. Nevertheless, it also aimed at raising the public profile of the Project.

This Interactive Conference took place on May 6th, 2022 in an hybrid format. A web-based live stream was available to all invitees, whereas invitees selected for physical attendance could participate at the Albert Schweitzer Haus in Vienna – the venue arranged for the Conference.

Prior to the conference, Deloitte drafted the necessary materials for the event which were also approved by the Project stakeholders. The materials consisted in: conference agenda, invitations for the various categories of invitees, presentations for the private and public part of the conference, draft script of the panel discussion.

Logistical aspects of the event were also funded by and handled via the Technical Assistance and Information Exchange Instrument (TAIEX) of the European Commission.

The conference was divided into two main sessions: a public and a private one. The public session included the extension of invitations to supervised entities of the FMA and the NBR. It was held between 09:30 and 12:00 and consisted in a keynote speech and a panel discussion between high ranked experts within the field of climate and environmental risk management and representatives of the FMA and the NBR. The panel was comprised of:

- Mr. Helmut Ettl, Executive Director of the FMA;
- Mr. Cristian Popa, Member of the Board of Directors at the NBR;
- Prof. Irene Monasterolo (keynote), Professor at EDHEC Business School and EDHEC-Risk Institute in Nice (France) and senior research fellow at the Vienna University of Economics and Business (Austria) and Boston University (USA);
- Mr. Laurent Clerc, Head of Research and Risk Analysis Directorate at the Autorité de Contrôle Prudentiel et de Résolution (ACPR);
- Ms. Laura Rinaldi, Head of the Financial Sector and Access to Finance Unit in DG Reform.
- Ms. Christa Janhsen (panel host), Deloitte Partner in Financial Advisory

The private session, implying the presentation of the Comparative Analysis outcomes, was restricted to members of the FMA, the NBR and DG Reform. It was held between 13:00 and 16:00, on the same day. The private session, hosted by members of the Deloitte project team (i.e. Ute Schoeggl, Cătălin Ruja, Andrei Culda), covered the following topics:

- An introduction and definition of climate and environmental risks; effects of climate and environmental risks on financial market participants;
- The approach of the comparative analysis exercise;
- Supervisory expectations for climate and environmental risk assessment at global level;
- Expectations on strategy and governance of climate & environmental risks, risk management and disclosure requirements;
- KPIs and KRIs for assessing climate and environmental risks with examples;
- Climate risk scenario definition, with a focus on NGFS scenarios;
- A best-practice comparison related to climate and environmental scenarios;
- A best-practice comparison related to climate risk stress-testing practices and subsequent approaches for increasing sector granularity and data usage;
- Way forward for developing KPIs, KRIs, monitoring frameworks and climate & environmental scenarios within the context of the project.

Both parts of the conference allowed for Q&A sessions with the audience.

After the event was held, Deloitte produced a summarizing report covering the context and organizational aspects of the conference, the summary of the public and private sessions (including an overview of discussed topics), a transcript of the Q&As, feedback and lessons learned, and support materials (including the list of online and physical attendees).

Please refer to "Annex C – Deliverable 3 – Interactive conference" for the associated materials.

2.4 Deliverable 4a – Report evaluating data gaps for Austria

2.4.1 Deliverable 4a – Scope

The goal of this deliverable was to establish a deep understanding of the currently available climate and environmental risk data, highlight any possible data gaps and develop approaches and methods to close these gaps under deliverable 5a.

In the case of the Austrian FMA, the specific approach in identifying and closing data gaps considered the outcomes of the "Focal Group Green Finance" initiative and the FMA's published Guide for Managing Sustainability Risks with its concerns about data availability. As the current measures and indicators did not sufficiently capture the impact of environmental and related policy risks, the main goal in this respect was to address the broad spectrum of financial market sectors which the FMA supervises, thus performing a comprehensive data gap assessment and paving the way for cross-sectoral KPI, KRIs and climate/environmental scenarios.

2.4.2 Deliverable 4a – Completed tasks and work

For identifying climate and environmental data requirements, the FMA decided to follow a quantitative, data-driven approach based on definition of climate and environmental KPIs and KRIs. In developing measurable and quantifiable KPIs and KRIs for the Austrian economic and environmental contexts, one of the primary requirements was to determine the most appropriate data sources and methods to be used and subsequently, the necessary data granularity and frequency for these KPIs and KRIs.

The proposals of potential KPIs and KRIs for the monitoring of climate and environmental risks needed precise and clearly understandable definitions. Therefore, following the assessment of best practices

within other international financial supervisors, regulators and selected (re)insurance firms as part of Deliverable 2, Deliverable 4a assessed possible climate and environmental data sources for Austria.

Deliverable 4a therefore established a deep understanding of the current climate and environmental risk data situation of Austria with the idea of getting a comprehensive understanding of the current data availability as well as the accompanying data requirements by linking these data sources directly to proposals for the KPI and KRI monitoring of the Austrian financial markets and the supervised entities of the FMA. In the course of identifying data needs and analysing data availabilities, potential data gaps were assessed and documented.

In Deliverable 4a, general definitions of KPIs and KRIs were provided and their usage for monitoring purposes was elaborated. Deloitte provided analysis of the current data situation for climate and environmental risks and details on the required as well as available data in connection with potential data gaps. The data discussed contained portfolio data and entity data on the one hand and physical as well as transition risk data. The analysis for each data type followed the same methodological structure:

- Deduction of data required
- Analysis of available data
- Definition of data gaps

The analyses in Deliverable 4a have shown that data availability and data accessibility for building operationally viable KPIs/KRIs on sustainability risks for FMA's purposes were still critical topics, where hardly any straight-forward answers were available. Deliverable 4a covered physical as well as various transition and also pandemic risks.

A successful mapping of entity and portfolio data with relevant risk data was required. Data analysis showed that successful mapping in this area was by no means granted, even if conceptual construction of KPIs/KRIs is successful. Due to necessary modularity and multiple level-construction of KPIs/KRIs, success greatly depended on the connector variables (mapping keys) as neither availability nor sufficient data granularity and precision could be taken for granted in the current ESG-data landscape.

This led to the final topic in Deliverable 4a – development and evolution. It became evident that many of the multitude of sources for environmental and ESG-risk categories sources come with caveats. They were connected to commercial aspects of availability, questionable coverage, issues with mass data retrieval and processing, inconsistencies in data-granularity and other comparable issues.

These topics are the main parameters determining the current status of data availability and data gaps in this report. Consequently, Deliverable 4a was the basis for the steps to come – especially for the gap closure report (Deliverable 5a).

Please refer to "Annex D – Deliverable 4a – Report evaluating data gaps for Austria" for the associated materials.

2.5 Deliverable 4b – Report evaluating data gaps for Romania

2.5.1 Deliverable 4b – Scope

The scope of evaluating data gaps for Romania was based on the NBR's context, in which the central bank had already developed and conducted surveys targeting the banking sector to assess the climate

related issues (such as governance, monitoring of physical risk/transition risk, assessment of exposures to brown / green assets and green financing).

Deliverable 4b set the task of analysing the questionnaire already disseminated by the NBR to the Romanian banking sector and assessing the opportunity of an additional questionnaire or of other means for collecting the data on a frequent basis.

2.5.2 Deliverable 4b – Completed tasks and work

Deloitte adopted a 4-step approach for Deliverable 4b, starting with collecting and analysing all information that was made available by the NBR related to the 2020 edition of the climate risk questionnaire. This included Excel versions of the questionnaire in both Romanian and English languages, a summarizing report of the responses including several statistical figures, documents linked to the reporting of climate-related loans within the Central Credit Register, documents related to the polling of non-financial entities regarding access to finance, including green finance. Afterwards, the project team proceeded with identifying and analysing best practices for similar questionnaires. This was followed by a centralization of potentially relevant questions for Romanian credit institutions, several rounds of feedback between Deloitte and NBR teams, and ultimately by the creation of the NBR 2023 edition of the climate risk questionnaire.

Step 1 – Analysing the previous NBR questionnaire on climate risks (2020 edition) – this step implied a thorough analysis of the previous edition of the questionnaire and related materials made available by the NBR. The analysis documented the questionnaire's structure and the qualitative and quantitative analysis performed by the NBR that followed the questionnaire. Based on this review and in cooperation with the NBR, favourable conclusions were drawn towards the opportunity to run a new and updated edition of the questionnaire on climate risks.

Step 2 – Analysing similar practices of the supervisory authorities – this step implied documenting similar practices performed by supervisory authorities at EU and non-EU level. The following four examples were identified:

- The Bank of England 2021 Biennial Exploratory Scenario: Financial risks from climate change; besides pre-defined data templates that were specifically developed for quantifying exposure to climate and environmental risks, the exercise also included a qualitative questionnaire for the participants;
- The European Central Bank 2022 climate risk stress test: the initiative involved pre-defined templates for respondents, specifically designed for quantifying exposures to transition and physical risks, including a qualitative questionnaire with the purpose to gain "*an illustrative overview of the respondent's internally available stress testing capability and capacity including its climate risk stress testing framework, management and modelling practices*";
- The Banque de France questionnaire address to French banking groups facing climate change-related risks (2019): the scope of the exercise was mainly to assess how French banks were preparing for climate change and their alignment with relevant legislations;
- The European Banking Authority's Implementing Technical Standards on prudential (Pillar III) disclosures on ESG risks: besides templates for quantitative disclosures and information on related key performance indicators, the Implementing Technical Standards also included tables for qualitative disclosures on environmental, social and governance risks.

Step 3 – Collecting, centralizing, and selecting relevant questions for the updated questionnaire – Following Steps 1 and 2, the Deloitte team proceeded with selecting questions from the four identified examples as well as from the 2020 edition of the NBR climate change questionnaire, considering the objectives set out for the 2023 edition and as per the conclusions of Step 1.

Step 4 – Creating the 2nd edition of the NBR Questionnaire on climate change (2023 edition) – Based on the list of selected questions under Step 3, the Deloitte team proceeded with building the 2023 edition of the Questionnaire on climate change using the Excel platform. The questionnaire was built in line with the scope and conclusions set out in Step 1 and following a similar structure to the 2020 edition, with the intention to ensure some familiarity with the document for the respondent, and also by considering the supervisory expectations that were previously sent to financial institutions by the NBR. The questionnaire was designed to be clear, interactive and straightforward, using Active X elements and macros. Romanian and English language versions were produced, accompanied by separate filling-in guide and template for post-survey data centralization and scoring.

Following Steps 1 to 4, Deloitte produced a summarizing report documenting the methodological approach, the work undertaken for the deliverable, the structure and operational guidelines of the new questionnaire as well as recommendations for the running stage of the exercise. The annexes of the report included all documents developed for Deliverable 4b, as well as the identified similar exercises performed by other supervisory institutions.

Please refer to "Annex E – Deliverable 4b – Report evaluating data gaps for Romania" for the associated materials.

2.6 Deliverable 5a – Report on closing data gaps for Austria

2.6.1 Deliverable 5a – Scope

The goal of this deliverable was to close the gaps identified under deliverable 4a by further investigating different types of data available and KPI/KRI concepts. The scope was limited to the one of Deliverable 4a.

As outlined in the Request for Service (RfS), the initial intention was to execute a survey among supervised and non-supervised entities with the aim of covering data gaps. After the project alignment between Deloitte and the FMA, it was decided by the FMA, that a survey would not be conducted in order to deliver an independent result. Therefore, Deliverable 5a contains a report on closing the data gaps solely based on objective data retrievable without the inclusion of market participants and their customers. The decision to not conduct a survey was taken on objective grounds by the FMA and communicated in Steering-Committees in the early phases of the project.

The RfS also foresaw a dedicated meeting presenting the results of the deliverable to DG Reform, the NBR and the FMA. This meeting was covered within the non-public part of the closing event (Deliverable 10). The presented slide deck has been distributed to all relevant parties after the closing event.

2.6.2 Deliverable 5a – Completed tasks and work

Deliverable 5a expanded upon Deliverable 4a. Deloitte extended the gap report by further investigation into data sources and improved KPI concepts. The three main types of adaptations were as follows:

- Some data gaps were closed, either by gaining access to the desired databases or by the discovery of new data;
- Some data requirements became obsolete, as the indicator for which the data was intended was reformed, replaced or discontinued;
- In isolated cases, new data requirements emerged from a better understanding of the indicators. The latter were discussed including a detailed motivation.

On a high level, portfolio items may be equipped with environmental risk information in two ways: The risk data may either be directly available at counterparty level through supervisory reporting mechanisms or mapped into the portfolio from third parties, either on individual or aggregated level.

For the project, no risk data reported through the supervisory reporting mechanism was available. Thus, all risk data was gathered from third-party sources and mapped to the portfolio data. For this reason, the granularity of risk information for portfolio items was restricted by both the granularity of third-party data as well as the quality of mapping variables. During this project, both types of bottlenecks occurred. For example, highly granular data on real estate emissions could not be mapped in high resolution due to missing information on the building type and the resolution of wildfire risk data was less granular than the available mapping variable.

Data for some risk indicators, like ESG ratings or individual flood protection measures, could only be acquired or mapped on counterparty- or object-level. As of today, risk information on this level has not been made available for banks (mainly due to confidentiality reasons) and only a certain coverage for asset managers, insurance firms, pension funds and occupational pension funds was available.

To tackle the shortcomings discussed above, the following focus points were suggested: (i) Strengthening of reporting channels concerning risks information, (ii) Strengthening of reporting channels concerning mapping variables, (iii) Improvement of risk data granularity, (iv) Acquisition of object- or counterparty-level third party data.

Please refer to “

Annex F – Deliverable 5a – Report on closing data gaps for Austria” for the associated materials.

2.7 Deliverable 5b – Report on closing data gaps for Romania

2.7.1 Deliverable 5b – Scope

Under deliverable 5b, Deloitte was required to assist the NBR in carrying out a survey, particularly targeting SMEs and non-financial corporates, in order to assess climate risks impact on their business and opportunities and their mitigation measures (e.g. energy efficiency, decarbonization). In this respect, the contractor was to consult the NBR in using the existing surveying infrastructure and in establishing a representative sample, as well as in designing the questionnaire to adequately narrow down data gaps. Deloitte also recommended to involve other entities which may be able to provide useful data, such as the Ministry of Energy (which is responsible for energy efficiency monitoring) and the Ministry of the Environment, Waters and Forests. The survey shall address both transition and physical risks data, depending on business sector specifics and geographical factors.

For the duration of the NBR’s data collection exercise, Deloitte was to support the Central Bank and participating entities on running and producing data required by the survey. In this respect, prior to running the survey, Deloitte was to organize a workshop with involved NBR employees to discuss the

questionnaire scope, structure, individual questions and potential reporting difficulties, thus putting them up to speed with relevant information and enabling them to better engage with firms to receive good quality and reliable data. To further facilitate understanding and firms responses, especially in cases that are not accustomed to non-financial disclosure requirements, Deloitte was to also generate an easily accessible and didactic guide, as well as a workshop, for NBR staff with regards to filling in the survey, detailing each question and explaining which data is required, under which format and how it should be obtained.

Recognizing that certain data gaps (i.e. company carbon emissions, use of renewables at firm level, investments in green solutions and exposure to location-based physical risks) may not be closed following the data collection exercise, Deloitte was to draw a list of necessary actions and policy requirements for the NBR to support surveyed entities in producing data. Additionally, Deloitte was to support the NBR in running the preliminary survey to a reduced number of firms, prior to sending it to the entire sample. Finally, Deloitte was to assemble all relevant information regarding the preparation, running and results arising from the surveying exercise into a report to be presented to the NBR staff. This report was to include an analysis of the existing data gaps, as well as develop recommendations on how to close them, while presenting the results and annexing relevant data and methodology.

2.7.2 Deliverable 5b – Completed tasks and work

Design of a questionnaire for non-financial companies

In designing the survey, the Project team established meetings with relevant national authorities to understand the national institutional framework concerning transition and physical risks.

For **transition risks**, an online meeting between Deloitte Romania, the NBR and the Ministry of Energy was organised in January 2022 where the collection of data by the Ministry of Energy was explained.

For **physical risks**, Deloitte explored the national framework regarding such risks, based on data provided by the RO RISK project[1], the National Action Plan on Disaster Management, as well as other national and international resources. Based on the findings of this research, a second meeting was organised in February 2022, involving the representatives of the Ministry of Environment, Waters and Forests, the National Meteorological Administration, the National Forests Directorate Romsilva, functioning under the authority of the Ministry of Environment, Waters and Forests, the NBR and Deloitte Romania.

A further meeting discussing drought risk was organised with a representative of the National Meteorological Administration. The discussion was centred around the drought data and the drought maps that this Administration has developed and is currently managing, and the possibility for the NBR to obtain access to some of the data.

The results of these meetings were considered in the development of the survey.

Initial discussions between the NBR and Deloitte favoured the development of a survey that would require non-financial companies to self-evaluate their carbon emissions. The structure of the survey comprised 3 sections. Section A inquired about the capacity of the companies to deal with evolutions

[1] Project coordinated by Romanian General Inspectorate for Emergency Situations in partnership with 13 other national research institutes, universities and state authorities with the objective of facilitating the exchange of data and information on identified physical risks, in order to identify joint action priorities to reduce disaster risk through an integrated approach. The Project was carried out between 2016-2018 and it was co-funded by the European Social Fund under the Operational Programme Administrative Capacity

regarding energy costs, while section B inquired about the capacity of the companies to face adverse developments regarding climate change. The carbon footprint section (Section C) was developed as a simplified version of the GHG calculation tool developed by the GHG Protocol[2]. The tool was adjusted by anchoring it to the Romanian context, using the national emission factors communicated by the National Environmental Protection Agency specific to each type of fuel and activity category.

Additional to the general GHG Protocol tool, further specific questions were developed to cover the section on emissions from industry and agriculture, with the consultation of external experts[3].

A guideline on explaining the context and the most important aspects of the survey, as well as the national legal framework about climate change, but also practical advice on how to calculate GHG emissions was developed in parallel with the following structure:

- How does climate change affect us and why do we need to act?
- What are the advantages of carrying out an emissions inventory?
- Greenhouse gases;
- Methods to calculate the emission factors for GHG;
- Solutions to calculate GHG emissions;
- Further readings and literature.

Initial sampling of the survey

The draft survey and the accompanying guidelines were tested on ten respondents, consisting in companies that were considered most at risk from a transition and physical risks point of view, in order to see how they would respond to the questions of the survey and which kind of feedback will emerge. Both large companies and SMEs were invited to complete the survey.

Workshop and assistance for NBR employees

Prior to the NBR launching the survey, Deloitte organised a workshop with NBR employees involved in running the survey to guide them in understanding the questions and expectations, so that they can also provide guidance to the firms completing the questionnaire. The workshop was held on the May 10th, 2022 and enjoyed the participation of approx. 150 employees from the NBR.

Subjects such as the questionnaire's scope, structure, but also potential reporting difficulties were addressed in the workshop, thus enhancing the capacity of the NBR with relevant information so that they can better engage with companies to receive qualitative and reliable data. Deloitte generated an easily accessible and didactic electronic presentation for the NBR staff with information on how to fill the survey in order to facilitate the understanding of it.

A Q&A section was opened on a dedicated Project SharePoint, which attracted a very high number of questions and comments from the NBR employees. All gathered comments were analysed and responded to, and many of the comments were taken onboard by Deloitte, modifying and improving the survey based on their feedback. There was a particularly high demand for clarifications concerning carbon footprint, reason for which the Deloitte's team decided to create an additional tutorial on how to complete the carbon footprint section.

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[2] Further details available at link: https://ghgprotocol.org/calculation-tools#cross_sector_tools_id

[3] Special considerations for Ms. Mihaela Balanescu (UNFCCC External Review Expert) and Ms. Dana Sandulescu (Lecturer at the University of Agronomic Sciences and Veterinary Medicine in Bucharest)

Final sampling of the survey

Sampling of the survey was performed by the NBR in collaboration with the National Institute of Statistics. The sample was considered representative at national and regional levels and it was drawn through statistical procedures.

Deloitte provided support to the NBR throughout the surveying process regarding incoming technical questions from respondents, as well as from the NBR support staff.

Centralisation and cleansing of responses

Almost 7 500 entities responded. Upon the finalization of the surveying period, the NBR provided Deloitte a copy of the survey template containing the aggregation of reported values from all respondents for each question, and a database containing respondents' individual responses for all survey questions, in an anonymized manner. For the processing of individual respondent's data and aggregation of values, the NBR utilized the MatLab software, a tool for accessing and processing large datasets. Deloitte proceeded with cleansing the data and performing a qualitative analysis.

Following the completion of the first survey addressed to non-financial entities on topics related to climate and environmental risks, the Deloitte team produced a report summarizing the methodological approach of the Deliverable, the completed work, the main findings of the survey, as well as recommendations for future similar exercises. All materials relevant to Deliverable 5b were annexed to the report.

Please refer to "Annex G – Deliverable 5b – Report on closing data gaps for Romania" for the associated materials.

2.8 Deliverable 6 – Developing monitoring frameworks for financial market supervision related to environmental, including climate risk

2.8.1 Deliverable 6 – Scope

The goal of Deliverable 6 was to provide the FMA and the NBR a framework for their supervisory practices related to climate and environmental risks assessments of their supervised entities. On the one hand, the framework should have covered methods to assess the impact of climate and environmental risks on supervised entities. Additionally, the framework should have informed supervisors on how to interpret the results and their consequences, supported supervisory decision-making and delivered evidence-based assessments which could be used for supervisory measures.

The climate and environmental monitoring framework was expected to be self-explanatory and to be re-assessable by the FMA and the NBR themselves on a regular basis to support supervisory actions related to the management of climate and environmental risks.

Based on the understanding gained in the comparative analysis (Deliverable 2) and the data collection and data gap exercises (Deliverable 4 and 5), Deloitte, together with the FMA and the NBR, was required to build comprehensive climate and environmental risk monitoring frameworks tailored for Austria and Romania.

The following non-exhaustive list of performance and risk indicators for climate and environmental risks was required to be considered:

- Transition risk indicators: GHG emissions, carbon sensitivity of relevant exposures;
- Physical risk indicators: exposures prone to flood and drought risk, energy efficiency in housing portfolios and insurance coverage and non-insurability against certain risks;

2.8.2 Deliverable 6 – Completed tasks and work for Austria

For Austria, the focus was on the development of a data-driven monitoring framework. Considering the understanding gathered about the current data situation for Austria and the current practices of the FMA, Deloitte, together with the beneficiary, defined supervisory indicators and measures tailored to the Austrian market and the portfolios of supervised entities.

In this Deliverable, dashboard strawmen were created and the methods and concept underlying the dashboard were designed based on information gathered in previous deliverables. The deliverable contained a manual/methodological document on data processing and indicator concepts, dashboard strawmen, user manuals and the R code necessary for the processing of used data.

The methodological document was structured into three chapters. Chapter 1 discussed methods relevant for all risk indicators. These include portfolio (pre-)processing, risk-portfolio-mapping and the functioning of the data model underlying the dashboard concept. It also provides a detailed view on the treatment of portfolio geolocation data. Chapter 2 provided a deep dive into individual indicators. It illustrated concepts and ideas, listed datasets used, discussed current limitations and featured an outlook on potential future improvements and alternatives. Chapter 3 was used to list and describe all major data sets used. It gave information about content, providers, means of access, most recent updates and update policy if available. It also contained a short assessment of the quality standards of each data set.

The R code was created by Deloitte and reviewed in close collaboration with the FMA. Comments allow new users to quickly understand the code and enabled the FMA to update or adapt the code if needed. Main points of the code are:

- Preprocessing of risk and portfolio data (for example standardization, cleaning of errors and duplicates);
- Mapping risk and portfolio data;
- Creating input files to be imported into dashboards.

A total of 13 dashboards were created. Part of the work performed was the design of the graphical interface of the dashboard in Microsoft Excel. Different charts and plots enable the user to quickly assess a variety of characteristics of the portfolio of the supervised entity with regards to the chosen risk indicator. Each risk indicator was displayed in a separate sheet (except for Refinitiv-based indicators). The plots and charts were based upon pivot tables. Slicers enabled the user to choose categories such as NACE Code, Instrument Type, Specific SEs and many more depending on the dashboard, as not all categories are available for all SEs and for all Risk Types. The import of the data into the dashboards was conducted using the Microsoft Excel Power Query and Data Model.

The user manuals summarized the necessary steps to update and import new data into the dashboard and serve as quick reference guide for the users.

2.8.3 Deliverable 6 – Completed tasks and work for Romania

For Romania, the starting point of Deliverable 6 was the existing NBR Climate monitoring dashboard. Deloitte performed a review of the dashboard, organizing several meetings with the NBR to understand the underlying methodology and then provided feedback to the NBR for refinement and inclusion on further climate- and environmental-related data as well as key metrics and indicators. A comparison with the framework and indicators for the Austrian case was discussed with the NBR.

It was ultimately decided by the NBR that the monitoring framework should be maintained within the framework of the existing approach, as a yearly qualitative and quantitative top-down assessment based on publicly and internally available data. Nevertheless, additional data sources were investigated in order to enhance the existing climate risk analysis framework, including via discussions with other governmental entities with competencies in the energy, climate and environmental fields (i.e. Ministry of Energy, Ministry of the Environment, Waters and Forests – discussions also as part of Deliverable 5b). Following the discussions, a memorandum of cooperation was established between the NBR and the respective entities. However, no transition or physical risk data from the entities was provided to Deloitte and the NBR for analysis during the duration of the project. As such, Deloitte resorted to identifying potential improvements and gaps of the existing monitoring framework which could be filled using publicly available data.

Deloitte provided the NBR the following information for the climate-related monitoring framework:

- Data related to transition risks in the form of Scope 2 and 3 emissions data for 58 economic sectors (NACE codes); this enabled the NBR to perform an extended analysis of exposure of the Romanian economy to transition risks;
- Data related to physical risks, including several data sources for each risk type and recommended sources for each risk type. The covered risks were regarded as the most impactful for the Romanian territory i.e., flood risk, drought risk and heat stress. For each risk type, Deloitte also made suggestions of potential indicators to be covered, methodology for assessing risk levels;
- Data related to green bond issuances by Romanian financial entities, including an assessment of alignment to internationally accepted green bonds standards.

The NBR included some of Deloitte's considerations in the updated edition of the climate-related monitoring dashboard of credit institutions and issued the report in October 2022.

The above completed work was documented by Deloitte in a summarizing report.

Please refer to "Annex H – Deliverable 6 – Developing monitoring frameworks for financial market supervision related to environmental, including climate risk" for the associated materials.

2.9 Deliverable 7 – Establishing the methodologies and developing environmental risk, including climate risk, scenarios for supervisory purposes

2.9.1 Deliverable 7 – Scope

The goal of Deliverable 7 was to provide the beneficiaries the know-how and tailored scenarios for Romania and Austria to identify, measure and address financial market-related environmental risks (including climate risks) for regulatory purposes.

The proposed methodology is aligned with best supervisory practices and strikes a good balance between sophisticated, refined approaches and the need to maintain focus on key factors relevant for climate change and environmental risk management. It also considers state-of-the-art industry practices when meaningful.

2.9.2 Deliverable 7 – Completed tasks and work

In relation to Deliverable 7, Deloitte completed the following activities:

- performing an analysis on NGFS Phase 3 scenarios – narrative, key elements and updates;
- based on a comparative analysis of best practices on climate risk stress test scenario specific set-up, including on several technical aspects of the scenarios, and following further consultations and alignment with the NBR and the FMA on expected stress testing focus, the deliverable includes a set of recommendations on specific scenario set-up;
- an overview of the NiGEM macroeconomic model[4] and a presentation of its main set-up for the NGFS climate change scenarios is provided;
- at the beginning of the project, NiGEM included a more reduced model for Romania (including for Phase 3 editions of NGFS scenarios). While the reduced form model still allowed climate risk scenarios integration, the list of output variables is more limited for reduced model and thus, in order to fully address the needs of the stress testing exercise and the RfS requirements (e.g. additional macroeconomic variables for the household sector), Deloitte and the NBR collaborated with the National Institute of Economic and Social Research (NIESR) to provide the necessary data series to support the extension of the model for Romania into a fully-fledged model;
- NGFS-NiGEM scenarios do not include a granular, economic sectors breakdown of climate change impact. Based on best practices identified, the deliverable includes two advanced multi-country input-output models used by supervisors: the Banque de France approach (the production network model) (June 2020)[5] and the De Nederlandsche Bank N.V (2018)[6] and OeNB (2021)[7] extended Leontief model approach. The models are implemented using granular, country*sector input-output matrices as well as domestic and external final demand data thus allowing comprehensive modelling of carbon tax propagation across sectors based on trade relations between sectors within countries and also across countries, in a world-wide coverage configuration;
- additionally, in line with best practices from major private tools providers[8], Deloitte in-house carbon elasticity model for the sectoral level break-down is also presented. Aside sector level impact, this model allows calculation of counterparty level impact based on their specific emission intensity, which is a relevant feature for NBR stress testing needs;

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[4] Access to NiGEM after the current project's finalization is subject to purchasing a subscription plan

[5] Allen et al (2020) Climate-Related Scenarios for Financial Stability Assessment: an Application to France, July 2020, Banque de France WP #774 and Devuld A. and Lisack N. (2020) Carbon Tax in a Production Network: Propagation and Sectoral Incidence, BdF WP #760

[6] Bun, M. J. G. (2018). The economic impact of pricing CO2 emissions: Input-Output analysis of sectoral and regional effects, October 16, 2018

[7] Guth, M., Hesse, J., Königswieser, C., Krenn, G., Lipp, C., Neudorfer, B., Schneider, M., Weiss, P. (2021). OeNB climate risk stress test – modelling a carbon price shock for the Austrian banking sector

[8] See for example the comprehensive review included Bingler J.A. and Senni C.C. (2020) Taming the Green Swan: How to improve climate-related financial risk assessments, Center for Economic Research at ETH Zurich WP 20/340

- the deliverable also includes an analysis on Exiobase database, which, based on best practices, is the main proposed source for sector level data used by these models (alongside NGFS scenario general data);

- regarding the physical risk impact, the current NGFS scenarios integrated chronic physical risk on the entire range of macroeconomic variable (damage function results are accounted for in NiGEM), acute physical risk is integrated only globally as GDP shock. The main physical risks for Romania and Austria have been identified, namely drought and river flood, and an in-depth analysis and modelling were carried out to assess the country-level impact and then, with more granularity, its region-level breakdown. Based on the estimated magnitude of impact at country level, from a practical point of view on stress testing application, the results on assessing physical risk impact seem specifically relevant for Romania;

- for the FMA, similarly with the climate risk scenario used by the EIOPA in their 2022 climate risk stress testing, the deliverable includes several specific financial variables at different granularity, but generally with a global coverage (either multiple countries, or aggregated global level for sector level breakdown variables):

    - risk free rate;
    - sovereign yields;
    - corporate yields differentiated by sector;
    - equity and corporate credit spreads differentiated by sector;
    - commercial real estate prices.

- Consequently, together with the variables already available from NiGEM for each scenario (fossil fuels and carbon prices, inflation rate, residential real estate prices), the deliverable output covers the variables published by the EIOPA in their accompanying scenario Excel file for the 2022 climate risk stress testing exercise. Generally, these specific variables have been derived based on publicly available NGFS data and on the results of the sector level modelling described above, following a similar approach with the one used by the EIOPA as per the related scenario documentation;

- In order to answer the NBR's stress-testing needs, additional financial and macroeconomic variable shocks were modelled based on the extended NGFS-NiGEM outputs: private consumption, gross fixed capital formation, sovereign risk, credit default swap, Euro Area GDP and inflation, Bucharest real estate index, national commercial real estate index, interest rate, swap rates and equity.

Please refer to "Annex I – Deliverable 7 – Establishing the methodologies and developing environmental risk, including climate risk, scenarios for supervisory purposes" for the associated materials.

2.10 Deliverables 8a and 8b – Capacity building for Austria and Romania

2.10.1 Deliverable 8a and 8b – Scope

The main purpose of this deliverable was to help the FMA and the NBR to integrate the results of the theoretical work performed under the previous deliverables into their supervisory practices. Namely, the goal was to provide comprehensive training to the FMA and the NBR staff on the developed

monitoring framework and climate and environmental scenarios of Deliverables 6 and 7 (including scenario-based decision-making) and to guarantee a smooth knowledge transfer.

As such, Deloitte was tasked with organising meetings and workshops in Vienna and Bucharest with each of the beneficiaries for transferring knowledge related to climate scenarios, KPIs and KRIs. The presentation materials were to be accompanied by handbooks documenting the implementation of previous deliverables.

2.10.2 Deliverable 8a and 8b – Completed tasks and work

Capacity building in relation to Deliverable 6

Regarding the knowledge transfer for deliverable 6, Deloitte held two workshops to ensure that the created knowledge is transferred to FMA employees who are responsible for supervision of the Austrian financial sector and not part of the project team. The first workshop, which covered the monitoring framework for the banking sector, was held on June 06th at the premises of Deloitte Austria. It was possible to join online, and a recording was provided for further training purposes.

A second workshop, which covered the non-banking monitoring framework, was held on June 12th via Microsoft Teams. A recording was provided for further training purposes.

Both workshops included a live demonstration of the dashboard strawmen and time for Q&As. The demonstration was conducted with anonymised data due to confidentiality reasons.

Apart from the two workshops, extensive sessions were held at the premises of the FMA and online to transfer knowledge from the Deloitte project team to the FMA project team. Therefore, the FMA was enabled to understand the underlying framework of the dashboard and adapt the dashboards should the need arise.

Furthermore, as part of deliverable 6, user manuals and a methodology document were written to provide in depth knowledge about the used indicators and processing methods. Within these documents, links to further reading material and informative sources were available.

With regard to transferring knowledge developed under deliverable 6 for the NBR, Deloitte held a three hour workshop on June 23rd at the NBR's premises. The session documented identified data sources for physical and transition risks specific to Romania and potential KPIs/ KRIs that can be developed based on these data sources. Additionally, Deloitte provided an overview of the EU-level Environmental, Social and Governance (ESG) regulatory framework with a particular focus on the banking sector's reporting obligations on the matter. As such, current and future reporting obligations were considered as potential additional data sources for developing new KPIs and KRIs. Q&A time was provisioned throughout the duration of the workshop.

Capacity building in relation to Deliverable 7

Regarding the knowledge transfer for Deliverable 7, Deloitte held multiple regular, technical workshops for consultation and alignment on proposed methodological approaches and to ensure knowledge is transferred to the FMA and the NBR team members (including more extended teams) (meetings held at the NBR premises on May 29th, 30th and June 16th, meetings held at the FMA premises on June 12th and 13th). Additionally, Deloitte prepared training presentations covering the methodological framework and handbooks (user manuals) covering all tools and working files. The

handbooks were prepared with focus on ensuring that users will be able to regularly update the estimations (e.g. following updates on underlying NGFS scenarios).

Please refer to "Annex J – Deliverable 8a and 8b – Capacity building for Austria and Romania" for the associated materials.

2.11 Deliverable 9 – Feasibility Assessment of digitalisation of environmental, including climate-risk analyses, KPIs and KRIs

2.11.1 Deliverable 9 – Scope

The goal of Deliverable 9 was to define methods and capabilities for the FMA for the automation and digitalization of climate and environmental scenarios/analysis, KPIs and KRIs; with respect to digitalization of Deliverable 7, the scope was also extended for the NBR.

Deloitte was tasked with drafting a feasibility study including recommendations as to how the above-mentioned forward-looking scenarios addressing environmental, including climate risks, and the related KPIs and KRIs could be digitalized and / or automated.

2.11.2 Deliverable 9 – Completed tasks and work

Deloitte drafted a summary report which assesses the possibilities for the automation and digitalization of climate / environmental scenarios, KPIs and KRIs, also providing a roadmap for achieving these goals. The deliverable included a list of options for several levels of automation and digitalization and provided an overview of the tools and methods needed for the different levels.

The report's first part covered (i) dashboard migration to other dashboard solutions, (ii) migration to data-warehousing solutions, (iii) extension to address level mapping for physical risks and connected data enhancement strategies.

i. Dashboard and Dashboard Migration: The deliverable covered Data Management, Visualization & Layout, Data Analysis & Filtering, and Debugging. Furthermore, an overview of different Dashboard solutions was given, outlining pros and cons. Lastly, the potential migration to a PowerBI solution was described. This includes an assessment of improvements as well as an indication of points that should be considered if a migration is conducted.

ii. Migration to data-warehousing solutions: The deliverable outlined key points to consider for including the data, used within the monitoring framework, into the data warehouse of the FMA.

iii. Extension to address level mapping for physical risks and connected data enhancement strategies: The deliverable indicated the steps necessary for an address level matching. Furthermore, it outlined pros and cons of decisions which need to be taken during the implementation of address level matching.

The second part of the report covered the digitalization feasibility assessment for climate-risk scenario analyses (Deliverable 7). Specifically, the automation opportunities for the range of modelling tools, codes and supporting working files developed under Deliverable 7 were explored.

The Deliverable presents potential opportunities for digitalization, especially on data processes and modelling integration into one single end-to-end solution (R or Python based), potentially enhanced with a user-friendly dashboard interface.

Additional automation opportunities such as comprehensive Robotic Process Automation (RPA) solution or Python/R-based data extraction automation were explored for specific tasks such as data extraction and processing.

The report also includes a discussion on potential cloud-based solutions.

Please refer to "Annex K – Deliverable 9 – Feasibility Assessment of digitalisation of environmental, including climate-risk analyses, KPIs and KRIs" for the associated materials.

2.12 Deliverable 10 – Closing event

2.12.1 Deliverable 10 – Scope

The goal of Deliverable 10 was to foster mutual learning and strengthening the working relationships between the parties involved in the project. Furthermore, this deliverable served to look beyond the end-date of the project and think about potential for further development.

Deloitte was tasked with organising a one-day conference with representatives from the NBR, the FMA and DG REFORM to present and discuss the outputs of deliverables 6 and 7, the main lessons learned of the project, potential for future development, feasibility studies, exchange experience gathered, discuss modes of implementations and potential follow-up measures.

The exact format, agenda, speakers and participants of the conference had to be agreed with DG REFORM taking into account the view of the FMA and the NBR. The conference was required to be organised either in Vienna or Bucharest at the premises of FMA or the NBR, unless COVID restrictions prevented it, in which case the conference had to be organised online.

Support materials had to be prepared and pre-approved with the stakeholders prior to the event.

Ultimately, a summarizing report was required, to include the main findings and lessons learned.

2.12.2 Deliverable 10 – Completed tasks and work

Deloitte proceeded with organizing the closing conference, with a view to presenting the outcomes of the project's Deliverable 4 ("Evaluating data gaps"), Deliverable 5 ("Closing Data Gaps"), Deliverable 6 ("Monitoring Framework") and Deliverable 7 ("Climate Scenarios"); furthermore, the Closing Conference aimed at fostering mutual learning, strengthening the working relationships between the parties involved in the project and allowing for discussions about potential developments beyond the end date of the project.

This closing conference took place on March 17th, 2023 in a hybrid format. A web-based live stream was available to all invitees, whereas invitees selected for physical attendance could participate at the National Bank of Romania's headquarters – the venue arranged for the conference.

Prior to the conference, Deloitte drafted the necessary materials for the event which were also approved by the Project stakeholders. The materials consisted in: conference agenda, invitations for the various categories of invitees, presentations for the private and public parts of the conference, draft script of the panel discussion.

Travel arrangements for the FMA and the special event guests were organized and funded by the Technical Assistance and Information Exchange Instrument (TAIEX) of the European Commission.

The conference was divided into two main sessions: a public panel discussion and a private session. The public session included the extension of invitations to representative of more experienced supervisory institutions in Europe. The public panel was held between 09:30 and 12:00 and consisted in a discussion between high-ranked experts within the field of climate and environmental risk management and representatives of the FMA and the NBR. The panel was comprised of:

- Mr. Leonardo Badea, Vice-Governor of the NBR;
- Ms. Nathalie Berger, Director, Directorate for Support to Member State Reforms, DG REFORM
- Mr. Jean Boissinot, Deputy Director, Directorate of Financial Stability, BdF / Head of Secretariat, NGFS;
- Mr. Stéphane Boivin, Acting Head of ESG Risks Unit, European Banking Authority;
- Ms. Katharina Muther-Pradler, Managing Director for Integrated Supervision, FMA;
- Mr. Eugen Radulescu, Director of the Financial Stability Department, NBR;
- Dimitrios Goranitis (panel moderator), Global Leader for the Financial Services Industry, Deloitte;

The private session of the Closing Conference implied a presentation focused on the results of Deliverables four, five, six and seven of the project. It was held between 13:00 and 16:00, on the same day. The private session, hosted by members of the Deloitte project team (i.e. Cătălin Ruja, Stephanus Kogler, Anamaria Stroia-Tilley, Andrei Culda), was split into 4 parts:

- Project scope and context;
- Overview of deliverables 4, 5 and 6 for the FMA;
- Overview of deliverables 4, 5 and 6 for the NBR;
- Climate & environmental scenarios and stress testing.

Both parts of the conference allowed for Q&A sessions with the audience.

After the event was held, Deloitte produced a summarizing report covering the context and organizational aspects of the conference, the summary of the public and private sessions (including an overview of discussed topics), a transcript of the Q&As, lessons learned, and support materials (including the list of online and physical attendees).

Please refer to Annex L – Deliverable 10 – Closing event for the associated materials.

2.13 Deliverable 11 – Final report

2.13.1 Deliverable 11 – Scope

The goal of Deliverable 11 was to provide an overview of all completed Deliverables and work, thus marking the successful closing of the Project, and reflecting on the almost two years of technical support and cooperation between the stakeholders.

2.13.2 Deliverable 11 – Completed tasks and work

Deloitte completed this task by:

- Submitting a final version of all reports and verifying beneficiary acceptance of these reports;
- Outlining the tasks completed for each deliverable;
- Defining and presenting the summarized action plans for each country to facilitate the stakeholders' implementation efforts of the project's results;

- Delivering lessons learnt; and submitting a 2-page non-technical summary of the project explaining in a simple language the purpose and contents of the project, for each country;
- Organizing a closing meeting with all Project stakeholders;
- Produce communication material in terms of a brochure summarising the key information and support the promotion of the project by providing social media context (i.e. short descriptive text and photos);
- Providing availability for a 2-hour meeting with the European Commission (meeting not set at the time of drafting the Final Report) to present the project (via a self-explanatory PowerPoint), answer any audience questions and potentially participate in a podium discussion.

3 Lessons learned during the implementation of the project

Climate and environmental risks and the associated supervision practices are a common challenge for financial supervisory institutions across the European Union, drawing a lot of their attention and resources with a great potential to foster collaboration on the matter. As such, the thematic of the Project helped a great deal in obtaining mostly positive collaboration responses from other supervisory institutions during the analysis of best practices, as well as for attracting key relevant experts for the two conferences. Undoubtedly, the positive responses were also influenced by the known beneficiaries and sponsor of the Project, namely official institutions of the EU and Member States.

The multi-country aspect of the Project with EU sponsorship has also proved a success, especially since this Project set under DG REFORM and the Technical Support Instrument (TSI)was a "first of its kind". The knowledge-sharing aspect and the achievements of the Project are proof that this type of Project setup is feasible, can yield positive results and may be replicated in future DG Reform Projects. We note however that considerations should be made for the most appropriate number of beneficiaries in a Project, such that each beneficiary gains the most out of the services provided; the risk of a "too general / not sufficiently tailored" Project scope is present. Furthermore, considerations should also be made with regard to grouping beneficiaries based on their specific mandates and not only on the topic of the requested support. The present Project has addressed the above aspects in both the Request for Service, as well as in the contractor's offer. While some common ground was maintained, during the implementation of the Project, the beneficiaries' interests diverged on several aspects, which required additional time and resource in clarifying beneficiaries' expectations and the services to be provided (especially in the drafting of the Inception Report). Nevertheless, as the Project progressed, the scope of each Deliverable became very clear and the Project team was able to adapt to specific refined expectations of each beneficiary to fulfil all tasks.

For data exchanges between the contractor and the beneficiaries, a non-disclosure agreement (NDA) was signed at the beginning of the Project. The process of agreeing on a NDA format that could be accepted by all parties was lengthy and resource consuming. Perhaps a pre-established NDA template, made available at the time of beneficiaries' support request to DG Reform and at the time of issuing the Request for Service, could have helped in signing the document and sharing data faster.

The proposed organisational structure during the initial stages of the Project proved functional and met the expectations of all stakeholders. The ad-hoc deliverable meetings, bi-weekly meetings and bi-monthly steering committee meetings were sufficient to keep all parties involved and up to speed with the status of each Deliverable. Any open points were discussed and resolved with little effort.

The timeline of each Deliverable set at the beginning of the project was adjusted several times based on the interests of the beneficiaries as well as based on the adjustments in scope. In most cases, a more qualitative and comprehensive Deliverable was preferred to the detriment of precisely following the initially established timelines.

4 Project presentation – support material

4.1 Action Plan to facilitate the FMA's implementation of the project's results

4.2 Action Plan to facilitate the NBR's implementation of the project's results

4.3 Project Summary – Purpose and content of the project

4.3.1 Project Summary – tailored for the FMA

The Project's goal was to contribute to institutional, administrative and growth-sustaining structural reforms in Romania and Austria, in the area of prudential supervision of environmental and climate risks. The Project was funded by the European Union via the Technical Support Instrument (TSI).

More specifically, the objective was to provide the Financial Market Authority of Austria (FMA) a monitoring framework, an assessment of best practices and relevant data on environmental (including climate) risks. In its role of supervisory institution, the objective was to supply the FMA with forward-looking environmental (including climate risk) scenarios, enabling it to measure risks via KRIs and KPIs and develop solutions mitigating environmental/climate risks to foster a sustainable and stable financial system.

The FMA shall use the results of this Project for the adjustment of their supervisory practices to account for the emerging environmental and climate risks the financial institutions they supervise are exposed to. Through this Project, the FMA fulfils its respective mandates.

The Project lasted 20 months – starting from October 2021 to June 2023.

The Project organization included a regular update and steering committee meetings for quality assurance. The key roles and responsibilities of the steering committee were to discuss the status of deliverables, to intervene when necessary to reconcile any potential delays or points of discussion, allocation of resources to support project implementation, to be informed of overall project progress, goals and deliverables.

The work on each deliverable was conducted by different working groups which were defined before the start of each deliverable. While the team composition varies, a core Project team remained.

The following deliverables were provided to the FMA and submitted to DG Reform:

Deliverable 1

A **"Kick-off meeting and inception report"**, containing the detailed final work plan for the project, the agreed approach and methodologies. The report, based on the RfS and on the outcomes of the meetings between stakeholders of the project, ensured alignment of expectations between stakeholders in terms scope, information needs, communication channels and feedback processes.

Deliverable 2

A **"Comparative analysis report on management of environmental risks, including climate risks"**, a best-practice analysis describing how other 26 public and private institutions have developed and used forward-looking scenarios, including in terms of stress testing and relevant KPIs and KRIs.

Deliverable 3

An **"Interactive conference"** was organized in Vienna, consisting in a one-day event bringing together experts from public authorities whose best practices in management of environmental risks have been identified and representatives from DG REFORM, the FMA and the NBR in order to foster exchange of experience and discuss possible implementing strategies.

Deliverable 4a

A "**Report evaluating data gaps for Austria"** was developed based on the results of Deliverable 2 and the work already performed by the FMA. The purpose was to identify required data to develop KPIs and KRIs and to assess appropriate means for collecting such data on a frequent basis.

Deliverable 5a

A "**Report on closing data gaps for Austria**" was developed to close data gaps identified in Deliverable 4a by further investigating different types of data available and KPI/KRI concepts. Upon consolidation between FMA and Deloitte it was decided to not conduct a survey.

Deliverable 6

A "**Monitoring frameworks for financial market supervision related to environmental, including climate risks**" for Austria was developed. Leveraging the closed data gaps from Deliverable 4a and 5a, Deloitte created Dashboard strawmen to visualize KPI/KRI. As the Risk indicators and the available data diverges across different supervised entity types, a total of 13 strawmen were developed. The maturity of the solution is to a extend that it is useable to assist in supervisory process of the Austrian Financial sector.

Deliverable 7

The **"Methodologies and environmental risk, including climate risk, scenarios for supervisory and financial stability purposes"** for Austria were established, tailoring each scenario to Austrian decarbonization paths and associated transitional and physical risks (including scenario-based decision-making). This deliverable leveraged work already performed by the BdF as well as the NGFS.

Deliverable 8a

"**Capacity building for Austria**", for which workshops were held to integrate the results of the previous deliverables (including scenario-based decision-making) and the transfer of knowledge gained within the project to the FMA. Furthermore, detailed methodologies and user manuals were written and provided to the FMA.

Deliverable 9

"**Feasibility assessment of digitalisation of environmental, including climate-risk analyses, KPIs, KRIs**", assessed the potential for automating forward-looking scenarios, improved geolocation mapping, and implementation of the work performed under deliverable 6 within the data warehouse of FMA.

Deliverable 10

"**Closing event**", a one-day event with representatives from the NBR, the FMA and DG REFORM was held in Bucharest, discussing outputs of Deliverables 4, 5, 6 and 7, main lessons-learned of the project and modes of implementing follow-up measures. A panel discussion with international speakers was integrated into the conference.

Deliverable 11

"**Final report**" capturing the activities carried out throughout the 20 months and summarized key outcomes and actions for implementing project recommendations. The report is accompanied by tailored communication material and closing meetings.

4.3.2 Project Summary – tailored for the NBR

The Project goal was to contribute to institutional, administrative and growth-sustaining structural reforms in Romania and Austria, in the area of prudential supervision of environmental and climate risks. The Project was funded by the European Union via the Technical Support Instrument (TSI).

More specifically, the objective was to provide the National Bank of Romania (NBR) a monitoring framework, an assessment of best practices and relevant data on environmental & climate risks. In their role of supervisory institution, the objective was to supply the NBR with forward-looking environmental & climate risk scenarios, enabling it to measure risks via KRIs and KPIs and develop solutions mitigating environmental/climate risks to foster a sustainable and stable financial system.

The NBR shall use the results of this Project for the adjustment of their supervisory practices to account for emerging environmental and climate risks which the financial institutions they supervise are exposed to. Through this Project, the NBR fulfils its respective mandates.

The Project lasted 20 months – starting from October 2021 to June 2023.

The project organization included a regular update and steering committee meetings for quality assurance. The key roles and responsibilities of the steering committee were to discuss the status of deliverables, to intervene when necessary to reconcile any potential delays or points of discussion, allocation of resources to support project implementation, to be informed of overall project progress, goals and deliverables.

The work on each deliverable was conducted by different working groups which were defined before the start of each deliverable. While the team composition varies, a core Project team remained.

The following deliverables were provided to the NBR and submitted to DG Reform:

Deliverable 1

A **"Kick-off meeting and inception report"**, containing the detailed final work plan for the project, the agreed approach and methodologies. The report, based on the RfS and on the outcomes of the meetings between stakeholders of the project, ensured alignment of expectations between stakeholders in terms scope, information needs, communication channels and feedback processes.

Deliverable 2

A **"Comparative analysis report on management of environmental risks, including climate risks"**, a best-practice analysis describing how 26 other public and private institutions have developed and used forward-looking scenarios, including in terms of stress testing and relevant KPIs and KRIs.

Deliverable 3

An **"Interactive conference"** was organized in Vienna, consisting in a one-day event bringing together experts from public authorities whose best practices in management of environmental risks have been identified and representatives from DG REFORM, the FMA and the NBR in order to foster exchange of experience and discuss possible implementing strategies.

Deliverable 4b

A "**Report evaluating data gaps for Romania"** was developed which included developing the 2023 version of the climate change questionnaire addressed to the Romanian credit institutions. The package included Romanian and English language versions, guide documents, operating instructions, and a scoring system.

Deliverable 5b

A "**Report on closing data gaps for Romania**" was developed assuming the development and running of a questionnaire addressed to non-financial entities in Romania on topics related to climate risks and GHG emissions' quantification. 7500 entities responded to the survey.

Deliverable 6

A "**Monitoring frameworks for financial market supervision related to environmental, including climate risks**" for Romania was developed. Leveraging on the outcomes of previous deliverables, Deloitte provided recommendations, additional data sources and KPI calculation methodology for updating the 2023 edition of the climate risk monitoring dashboard of the NBR.

Deliverable 7

The **"Methodologies and environmental risk, including climate risk, scenarios for supervisory and financial stability purposes"** for Romania were established, tailoring each scenario to Romania's decarbonization paths and associated transition and physical risks (including scenario-based decision-making). This deliverable leveraged work already performed by the BdF as well as the NGFS.

Deliverable 8b

"**Capacity building for Romania**", for which workshops were held to integrate the results of the previous deliverables (including scenario-based decision-making) and the transfer of knowledge gained within the project to the NBR. Furthermore, detailed methodologies and user manuals were written and provided to the NBR.

Deliverable 9

"**Feasibility assessment of digitalisation of environmental, including climate-risk analyses, KPIs, KRIs**", assessed the potential for automating forward-looking scenarios, and implementation of the work performed under Deliverable 7 within the IT framework of the NBR.

Deliverable 10

"**Closing event**", a one-day event with representatives from the NBR, the FMA and DG REFORM was held in Bucharest, discussing outputs of Deliverables 4, 5, 6 and 7, main lessons-learned of the project and modes of implementing follow-up measures. A panel discussion with international speakers was integrated into the conference.

Deliverable 11

"**Final report**" capturing the activities carried out throughout the 20 months and summarized key outcomes and actions for implementing project recommendations. The report was accompanied by tailored communication material and closing meetings.

4.4 Communication material

4.4.1 Project description

Project Title: Environmental scenario analysis and climate risk assessment – capacity building for Romania and Austria

Summary (max. 40 words): The Project, funded by the European Union, contributed to institutional, administrative and growth-sustaining reforms for the Financial Market Authority of Austria and the National Bank of Romania, in the area of prudential supervision of environmental and climate risks.

Context (max. 60 words): The world faces increasing challenges posed by climate change. A growing number of parties recognize the urgency of quantifying associated risks, mitigating and limiting adverse impacts. In line with the EU Sustainable Finance agenda, financial supervisory authorities in Romania and Austria sought to build capacity in macroeconomic supervision, stress-testing practices, and sector-level impact assessment of environmental and climate change.

Support delivered (max. 60 words): The Project involved documenting best practices in climate and environmental risk supervision, establishing the building blocks for climate and environmental risk assessment (i.e. identifying and closing data gaps), developing monitoring frameworks related to climate & environmental change, determining the economic impact of climate and environmental risk scenarios and helping the beneficiaries grow knowledge & capacity through training and collaboration.

Results achieved (max. 60 words): Key results: best-practice analysis on climate and environmental risks, two successful conferences and increased supervisory capacity.

Country-specific results:

- Romania: surveys for financial and non-financial entities, an updated climate risk dashboard, tailored scenarios with assessment of transition and physical risks
- Austria: data gap assessment, a monitoring dashboard for climate and environmental KPIs/KRIs, tailored scenarios with assessment of transition and physical risks

Mention of EU assistance: This project is funded by the European Union via the Technical Support Instrument (TSI)and implemented by the FMA/NBR, in cooperation with the European Commission's Directorate General for Structural Reform Support (DG REFORM).

4.4.2 Social media texts

"Climate goals cannot be achieved without a greener financial system. This is why DG Reform and Deloitte supported the Financial Market Authority of Austria and the National Bank of Romania in building capacity for environmental scenario analysis and climate risk assessment. More details available here."

"Physical climate risks are a pan-European concern. With the help of Deloitte and EU funding, financial supervisions in Romania and Austria were able to assess the impact of climate risks for their supervised entities. More details available here."

"We can address climate change risks only by working together. We are happy to announce that a project funded by the European Union, bringing together financial supervisors from Romania and

Austria, developed a monitoring framework and scenario-based analysis for climate risks. More details available here.”

4.4.3 Visual materials

The below images were taken during the two public conferences held as part of the project. More images are available in the final Deliverables package.

- Image from the interactive conference held in Vienna in May 2022

- Image from the closing conference held in Bucharest in April 2023

5 Annexes

5.1 Annex A – Deliverable 1 – Kick-off meeting and Inception Report

5.2 Annex B – Deliverable 2 – Comparative Analysis Report on Management of environmental risks, including climate risks

5.3 Annex C – Deliverable 3 – Interactive conference

5.4 Annex D – Deliverable 4a – Report evaluating data gaps for Austria

5.5 Annex E – Deliverable 4b – Report evaluating data gaps for Romania

5.6 Annex F – Deliverable 5a – Report on closing data gaps for Austria

5.7 Annex G – Deliverable 5b – Report on closing data gaps for Romania

5.8 Annex H – Deliverable 6 – Developing monitoring frameworks for financial market supervision related to environmental, including climate risk

5.9 Annex I – Deliverable 7 – Establishing the methodologies and developing environmental risk, including climate risk, scenarios for supervisory purposes

5.10 Annex J – Deliverable 8a and 8b – Capacity building for Austria and Romania

5.11 Annex K – Deliverable 9 – Feasibility Assessment of digitalisation of environmental, including climate-risk analyses, KPIs and KRIs

5.12 Annex L – Deliverable 10 – Closing event

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