SCR®
STUDY GUIDE & LEARNING OBJECTIVES

2023 EDITION

GARP®

SCR® | Sustainability and Climate Risk

2023 SCR® Study Guide and Learning Objectives

Topic Outline, Readings, Test Weightings

This SCR Study Guide and Learning Objectives document describes primary topics covered in the SCR Exam. The SCR Advisory Committee identified these curriculum topics as essential for risk managers navigating the field of sustainability and climate risk. The curriculum is weighted across these topics and re-evaluated annually to ensure the SCR Exam is timely and relevant.

Learning Objectives appear as bullet points at the beginning of each chapter in this Study Guide. These Learning Objectives are intended to help exam candidates identify major themes associated with each chapter of the 2023 SCR Certificate book. The required online readings listed under chapter descriptions are testable for the SCR Exam. Learning Objectives for online readings also appear on the GARP website.

This document is an important study resource and should be referred to regularly during exam preparation.

SCR Exam Approach

The SCR Exam is practice-oriented. The questions are derived from a combination of theory, as set forth in the 2023 SCR Certificate book, and real-world work experience. Candidates are expected to understand sustainability and climate risk concepts and apply these approaches to risk management activities. The 2023 SCR Certificate book covers knowledge areas necessary for individuals and organizations to succeed in today's rapidly changing risk landscape.

The Exam is comprehensive in nature, testing candidates on a number of sought-after SCR standards and recommended practices. The 2023 Exam includes one case study covering three to four Learning Objectives from the 2023 SCR Certificate book. The exam includes 80 total questions in a multiple-choice format.

2023 SCR Certificate Book

Questions for the SCR Exam are related to and supported by the eight chapters in the 2023 SCR Certificate book. The topics covered by these chapters were selected by the SCR Advisory Committee. It is strongly suggested candidates review the book in depth prior to sitting for the Exam. Each chapter begins with a set of Learning Objectives to guide candidates through their studies. Review questions conclude each chapter. An eBook copy is provided to all candidates who register for the Exam.

SCR Errata

GARP will update curriculum clarifications or printing errors in the SCR Errata 2023 regularly. Candidates can find the SCR Errata document in the candidate portal. If you identify a potential error or curriculum discrepancy, please submit this through the candidate portal, but only after checking the Errata to see if it may already have been addressed.

We welcome all types of submissions including minor editorial, grammar, and typographical errors. However, only substantial errors in content or questions will be posted to the official SCR Errata.

SCR Study Chapters

Chapter 1:
Foundations of Climate Change: What Is Climate Change?

EXAM WEIGHT | 8 - 12 questions

Learning Objectives

Climate change is one of the most important issues of our generation and future generations. Choosing how to respond requires both a knowledge of the science as well as an understanding of our policy options. This chapter will give a brief summary of these two aspects of the climate problem.

The specific Learning Objectives for this chapter are as follows:

- Define climate change and differentiate between weather and climate.
- Know the general trends of modern climate change, such as observed surface temperature, sea ice coverage, etc.
- Describe how the earth's climate has changed over long periods of time and different methods for measuring non-anthropogenic climatic changes at different time frames.
- Understand how the earth's energy balance, greenhouse effect, and radiative forcing affect the climate.
- Know the primary greenhouse gases and aerosols, their sources, and relative contribution to climate change.
- Understand the implications of different greenhouse gas global warming potentials as well as atmospheric lifetimes.
- Summarize how humans have contributed to atmospheric CO_2 increases and modern warming.
- Understand the distribution, frequency, and intensity of climate-driven economic and ecological impacts across geography and time.
- Understand contributors to, and risks from, sea level rise and ocean acidification.
- Describe extreme-event attribution science and the data and techniques scientists use to connect climate change to extreme events.
- Understand and describe how positive feedbacks influence climate change.
- Describe how climate tipping points could disrupt natural systems and harm human well-being.
- Explain the different approaches and key considerations of climate change adaptation, including maladaptation.
- Discuss trends in the energy system and how energy sources can contribute to or mitigate climate change. Understand relative carbon intensities of energy sources.
- Identify opportunities and strategies for renewable and low-emissions energy technology to act as climate mitigants. Discuss specific challenges (e.g., intermittency) deploying each technology.
- Understand the opportunities and drawbacks of implementing geoengineering techniques to combat climate change.
- Explain carbon budgets and emissions trajectories to stay within mitigation targets. Know key numeric global emissions limits, commitments, and scenario paths.

Chapter 2: Sustainability

EXAM WEIGHT | 8-12 questions

Learning Objectives

This chapter discusses the broad topic of sustainability, particularly as it relates to public policies, corporate actions, and financial institutions. The broad examination of sustainability in a policy, corporate, and investment context is important background before examining climate risk analysis (Chapters 3 and 6) and policy frameworks (Chapter 4) in greater detail.

The chapter starts by defining sustainability and differentiating it from the concept of environmental, social, and governance (ESG) issues and from climate risk. This chapter also discusses international goals on sustainability, notably the United Nations (UN) Sustainable Development Goals (SDGs).

The chapter takes a broad approach, touching on economic development, issues of social justice and equity (e.g., human rights), and environmental protection (e.g., biodiversity), as well as focusing primarily on concepts and general framing in preparation for later chapters that go into greater detail.

The specific Learning Objectives for this chapter are as follows:

- Define and explain the different aspects of sustainability, including Environmental Social Governance (ESG), corporate responsibility, and sustainable development. Understand how different entities use these concepts to implement and report sustainability and climate practices.
- Explain the relationship and intersection among sustainability, ESG, and/or climate change.
- Identify the key features of the Millennium Development Goals and 2030 Agenda.
- Describe the United Nations (UN) Sustainable Development Goals (SDGs) along with associated goals and targets.
- Discuss strategies for implementing and aligning with the SDGs (including case studies) and how the SDGs and sustainability can be material to companies.
- Define ecosystem services, subcomponents, and natural capital. Demonstrate how organizations depend upon and can impact ecosystem services.
- Trace the evolution of sustainability in governments, corporations, and financial institutions.
- Describe how organizations can “greenwash” and “greenwish” sustainability claims as well as actions to counteract these practices.
- Describe the life-cycle assessment process and how organizations use this tool to advance sustainability.
- Know the major sustainability frameworks and initiatives, their objectives, and to whom they are targeted.

Required online readings:

"UNEPFI Principles For Responsible Banking," United Nations Environment Programme Finance Initiative. (pages 3-38).

The specific Learning Objectives for this online reading are as follows:

- Explain the requirements and suggested measures to take for each principle of responsible banking.
- Understand and describe how banks have implemented the responsible banking principles, along with the benefits of implementing these principles.

"UNPRI Principles For Responsible Investment," Principles for Responsible Investment, 2021.

The specific Learning Objectives for this online reading are as follows:

- Describe how responsible investment approaches consider ESG issues with investment decision-making and ownership practices.
- Identify the six principles of responsible investment and potential ways to achieve them.

All required online readings can be accessed at https://www.garp.org/scr/readings/required.

Chapter 3:
Climate Change Risk

EXAM WEIGHT | 8-12 questions

Learning Objectives

This chapter provides a comprehensive introduction to the financial risks linked to climate change that throughout this text are referred to simply as "climate risk." It explains the two main subtypes of climate risk — physical risk (resulting from the physical weather impacts of climate change) and transition risk (resulting from the economic transformation to a net-zero carbon economy) — delving into the causes and implications of each type.

Chapters 6 and 7 return to, and expand on, the topic by explaining how financial institutions can measure and manage climate risk (Chapter 6) and how climate modeling is carried out, including through scenario analysis (Chapter 7).

The specific Learning Objectives for this chapter are as follows:

- Describe how climate risk can translate to financial risk.
- Differentiate physical and transition risks.
- Understand how hazards/drivers, exposure, and vulnerability interact to manifest physical and transition risks and provide examples of each.
- Define stranded assets and discuss how different sectors may experience stranded asset risk.
- Define and differentiate acute and chronic hazards. Provide examples.
- Discuss uncertainty, variability, and accuracy in hazard model predictions (e.g., frequency, timeframes).
- Identify data challenges modeling direct physical risk. Understand the current state of climate hazard data availability and what issues asset owners must consider when interpreting climate risk data.
- Define and provide examples of indirect risks.
- Discuss how physical and transition risks can provide opportunities for companies and sectors.
- Identify the drivers of transition risk. Categorize transition risks (e.g., technology, market) and provide examples of each.
- Discuss human capital as a stranded asset and the challenges associated with asset stranding and a just transition.
- Understand current industry trends for each transition risk category and strategies companies can take to reduce risk or manifest climate-related opportunities.

Required online readings:

"Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures," Task Force on Climate-related Financial Disclosures, October 2021. (pages 14-22).

The specific Learning Objectives for this online reading are as follows:

- Identify and discuss the purpose of the four Task Force on Climate-related Financial Disclosures (TCFD) disclosure parameters.
- Describe recommendations for TCFD disclosure parameters designed for all sectors.

"Risk Management Fundamentals," Global Association of Risk Professionals (GARP), December 2022.

The specific Learning Objectives for this online reading are as follows:

- Define the major categories of financial risk faced by organizations.
- Understand and articulate how risk managers identify, measure, and manage credit risk, market risk, liquidity risk and operational risk.

All required online readings can be accessed at https://www.garp.org/scr/readings/required.

Chapter 4:
Sustainability and Climate Policy, Culture, and Governance

EXAM WEIGHT | 8-12 questions

Learning Objectives

This chapter examines the wider policy and cultural context in which the move toward sustainability and climate risk integration in the private sector has occurred. It starts by describing international sustainability and climate policy frameworks to date and the challenges inherent in attempts to reduce emissions through global agreements.

It then describes how sustainability and climate change have become part of various policy frameworks, both public-sector- and private-sector-oriented, ranging from promotion to supervision and regulation. Finally, consideration is given to potential implications, both at the micro and macro level, of how policies and other transition drivers may impact society and corporate culture.

The specific Learning Objectives for this chapter are as follows:

- Discuss the evolution of international climate policy.
- Understand the relative scale of emissions by country.
- Summarize the history, outcomes, and obligations of major international climate agreements, and distinguish from the goals set in the Paris Agreement.
- Understand characteristics of the Paris Agreement.
- Explain the structure, benefits, and drawbacks of carbon pricing policies, including carbon taxes and emissions trading schemes.
- Describe sector-specific climate policies, such as the transportation and power generation sectors.
- Explain how climate policy occurs at the national and subnational levels.
- Describe and differentiate Scope 1, 2, and 3 emissions.
- Recognize the challenges associated with accounting for Scope 3 emissions.
- Differentiate the types of private-sector sustainability and climate investment policies, and how public policy has been used to promote adoption of green finance.
- Describe the function, purpose, and challenges of green taxonomies.
- Discuss how central banks incorporate climate change into supervision practices.
- Identify methods used to enforce sustainable investment and disclosure policies.
- Describe the trends in private-sector climate frameworks and identify important climate groupings.
- Understand the differences between climate-related risk and nature-related risk.
- Explain the broader societal and cultural impacts of climate change and policies.

Required online readings:

"A call for action: Climate change as a source of financial risk," Network for Greening the Financial System, April 2019. (pages 4-9).

The specific Learning Objectives for this online reading are as follows:

- Describe the six Network for Greening the Financial System (NGFS) recommendations for central banks, supervisors, policymakers, and financial institutions to manage environmental and climate-related risks.
- Explain how the NGFS recommendations can guide the financial sector in achieving the objectives of the Paris Agreement.

"The GHG Protocol: A corporate reporting and accounting standard (revised edition)," The Greenhouse Gas Protocol and World Business Council for Sustainable Development (WBCSD), March 2004. (Chapters 1, 3, 4).

The specific Learning Objectives for this online reading are as follows:

- Describe greenhouse gas (GHG) accounting and reporting principles.
- Understand the two distinct approaches that can be used to consolidate GHG emissions.
- Explain the concept and importance of operational boundaries in GHG accounting.

All required online readings can be accessed at https://www.garp.org/scr/readings/required.

Chapter 5:
Green and Sustainable Finance: Markets and Instruments

EXAM WEIGHT | 8-12 questions

Learning Objectives

This chapter focuses on financial-market developments relating to sustainability issues and climate-related risks and opportunities. The chapter begins by explaining what constitutes "green" and "sustainable" finance and covers trends and investment flows. It then includes a detailed examination of specific sustainable and green finance instruments and products, such as green bonds, green loans, and sustainability-linked bonds and loans.

The chapter considers the integration of ESG issues into investing, both through analysis and through investor engagement. It finishes with existing and emerging taxonomies and regulatory definitions, building on the policy material covered in Chapter 4.

The specific Learning Objectives for this chapter are as follows:

- Define and describe sustainable, green, and climate finance and understand their application.
- Identify trends and flows in sustainable, green, and climate finance.
- Describe green, social, and sustainable bonds.
- Explain the core components of the Green Bond Principles.
- Explain green loans and their markets.
- Define and describe sustainability-linked bonds and loans.
- Describe sustainable funds, green funds, and other sustainable finance products.
- Understand the integration of ESG and climate issues into investment and lending decisions.
- Understand how shareholders impact sustainability strategy of a company.
- Describe the existing and emerging approaches to defining sustainable and green finance.
- Explain the trends in ESG disclosure requirements for companies.
- Identify regulatory trends in sustainable and green finance.

Chapter 6:
Climate Risk Measurement and Management

EXAM WEIGHT | 12-16 questions

Learning Objectives

This chapter describes how climate risk is measured and managed, covering both types of climate risk: physical and transition (as described in Chapter 3). After an introduction, this chapter covers in detail how climate risk relates to more traditional risk categories at the company level, including operational risk, credit risk, liquidity risk, and underwriting risk. It then covers how climate risk can be a systemic risk with potential threat to financial stability, transmitting either through one of the previously mentioned channels or through market dislocations (market risk) or effects on countries (sovereign risk).

The chapter goes on to describe available data and analytical tools for measuring both physical and transition risks, building on material from Chapter 3. Finally, this chapter examines how climate risk can be, and is being, integrated into existing enterprise risk management (ERM) processes, ranging from governance structures and strategy setting to risk evaluation and disclosure. The material in this chapter sets the stage for Chapter 7, which builds on these topics by looking specifically at the application of scenario analysis to climate risk management.

The specific Learning Objectives for this chapter are as follows:

- Explain how climate risk manifests as financial risk through micro and macroeconomic transmission channels.
- Describe how climate risk affects company-level risks and other risk types, including operational, credit, liquidity, and underwriting risks and whether these risk types pose macro-level risks.
- Understand the associated risk metrics for and components of each risk type.
- Examine the effects of climate risk on company level risks such as operational, credit, liquidity, and insurance.
- Understand the potential for climate risk to cause systemic risk and a threat to financial stability. Describe the risk types that can have systemic effects, including market, sovereign, etc.
- Describe CVaR and its uses.
- Describe the data types and analytical tools to measure transition and physical risks at the company-level and their sources.
- Understand how to measure transition and physical risks at the portfolio level.
- Examine how climate risk drivers can be incorporated into existing ERM frameworks.
- Discuss how ERM frameworks are used in practice using case studies and examples.

Required online reading:

"Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures," Task Force on Climate-related Financial Disclosures, October 2021. (pages 52-54).

The specific Learning Objectives for this online reading are as follows:

- Understand the key advantages and disadvantages of common carbon footprinting and exposure metrics.
- Know the components of carbon metrics (e.g., revenue, current portfolio value, scopes).
- Fully calculate the weighted average carbon intensity of investments, total carbon emissions, and carbon footprint, given a set of inputs.

This required online reading can be accessed at https://www.garp.org/scr/readings/required.

Chapter 7:
Climate Models and Scenario Analysis

EXAM WEIGHT | 8-12 questions

Learning Objectives

This chapter describes how climate change risk can be modeled and analyzed through the use of scenarios, which can help companies and financial institutions to prepare for various possible physical and transition climate-related outcomes. The chapter begins with an introduction to scenario analysis as a general planning tool for companies. The chapter then reviews reference scenarios commonly used by climate scientists, policymakers, and corporations.

Then, the chapter examines climate scenario analysis as applied to physical and transition risk, building on the material in Chapter 3. The chapter ends with a detailed look at use cases of scenario analysis both in corporations and in a financial context.

The specific Learning Objectives for this chapter are as follows:

- Define climate scenario analysis and explain how organizations use scenario analysis.
- Explain the definition and purpose of global net-zero scenarios including carbon removal process.
- Describe IPCC scenarios and associated representative concentration pathways (RCPs) and shared socioeconomic pathways (SSPs).
- Understand the difference between RCPs and SSPs.
- Describe IEA scenarios and other key global reference scenarios.
- Understand the parameters that organizations need to consider for scenario development and analysis.
- Explain how scenario analysis is used for assessing transition risk.
- Describe IAMs and their uses.
- Explain how scenario analysis is used for assessing physical risk.
- Examine how all types of corporations (financial and non-financial) use climate scenario analysis.
- Describe how financial firms use climate scenario analysis for the investment process and climate risk exposure management.
- Explain different aspects of climate scenario analysis using case studies.

Chapter 8:
Net Zero

EXAM WEIGHT | 3-6 questions

Learning Objectives

This chapter provides an overview of the concept of net zero and its implications for different players in the economy. It begins with an introduction to the scientific background behind net zero and its link to global climate ambitions enshrined in the Paris Agreement. It further provides an overview of the key global initiatives that are mobilizing entities across the world to make bottom-up commitments and pushing them to begin the journey of reducing the climate impact of their own organization.

The chapter then outlines the various elements required to ensure the credibility of these targets. It explains the crucial role that transition plans can play in demonstrating that an organization is integrating decarbonization ambitions into its core strategy, and emphasizes the importance of interim targets and pathways and the transparent use of metrics to measure progress. It ends with a discussion of the emerging landscape of net-zero disclosure standards.

The specific Learning Objectives for this chapter are as follows:

- Explain the concept of net zero and how it relates to global climate goals.
- Discuss the types of key alliances in the UN Race to Zero.
- Explain the challenges of reaching net-zero for the public and private sectors.
- Describe the key attributes of national net-zero target strategies and emissions reduction approaches.
- Summarize how the GHG Protocol can be used by subnational governments.
- Describe the factors that affect different sectors' abilities to achieve net zero.
- Describe how organizations use transition plans to pursue net-zero carbon emissions and the tools private-sector actors can use to verify the credibility of net-zero commitments.
- Describe how net-zero pathways and interim targets are key to achieving credible and attainable net-zero targets across sectors.
- Identify carbon-related metrics and discuss how carbon-related metrics are used in reporting and project selection.
- Understand metrics used for net zero portfolio alignment, considering strengths and weaknesses.
- Describe the net-zero disclosure landscape and key stakeholders.

Frequently Used Terms

A list of acronyms and terms used on the SCR Exam. This list will be provided to all exam candidates on the day of the Exam.

CAR = carbon asset risk
CCS = carbon capture and storage
CEO = chief executive officer
CFO = chief financial officer
CO_2 = carbon dioxide
CO_{2eq} = carbon dioxide equivalent
COP = Conference of the Parties
COSO = Committee of Sponsoring Organizations of the Treadway Commission
CRO = chief risk officer
CSO = chief sustainability officer
CSR = corporate social responsibility
CVaR = Climate Value at Risk
ERM = enterprise risk management
ESG = environmental, social, and governance
ETS = emission trading system
EU Taxonomy = The EU Sustainable Finance Taxonomy
GHG = greenhouse gas
IAM = integrated assessment model
IEA = International Energy Agency
IIGCC = The Institutional Investors Group on Climate Change
IPCC = Intergovernmental Panel on Climate Change
KPI = key performance indicator
mm = million
NGFS = Network for Greening the Financial System
PRB = Principles for Responsible Banking
PRI = Principles for Responsible Investment
RCP = Representative Concentration Pathway
SDG = Sustainable Development Goal
SSP = Shared Socioeconomic Pathway
TCFD = Task Force on Climate-related Financial Disclosures
UN = United Nations
UNEP FI = United Nations Environment Programme Finance Initiative

2023 SCR Advisory Committee

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Deputy Chief Risk Officer
BMO

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Managing Director
Global Head of ESG Innovation and Solutions
S&P Global Sustainable1

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Analytics and Capital Modelling Director
Aviva plc

John T. Colas
Partner and Vice Chairman,
Financial Services Americas
Oliver Wyman

Neha Coulon
Global Head of ESG
Kirkoswald Capital Partners, LLP

Beth Gould Creller
Sustainability & Climate Risk (SCR) Program Manager
GARP

Sandro Díez-Amigo
Research Lead
Market Accelerator for Green Construction
International Finance Corporation

Novera Khan
Chief Risk Officer and Uniper SE Board Member
Uniper Global Commodities SE

Robert Litterman
Chairman, Risk Committee
Kepos Capital LP

Charmian Love
Global Director of Advocacy
Natura&Co

Michael Marano
Head of Strategy and Business Development
APX

William May
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GARP

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President
GARP Risk Institute

Julie Pullen
Founding Partner
Propeller Ventures

Corinne Raux
Senior Advisor
EU Taxonomy
UNEP FI

Tony Rooke
Executive Director and Technical Lead
Transition Planning and Sector Pathways
GFANZ

Michael Sheren
Fellow
Cambridge University Institute for Sustainability Leadership

Daren Smith
Chief Investment Officer, Public Equities
Abu Dhabi Investment Council

Tianyin Sun
Deputy Director
Center for Green Finance Research
National Institute of Financial Research of Tsinghua University

Jakob Thomä
Executive Director
2° Investing Initiative

Michael Wilkins
Executive Director, Professor of Practice
Centre For Climate Finance & Investment
Imperial College Business School

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HEADQUARTERS
111 Town Square Place
14th Floor
Jersey City, New Jersey
07310 USA
+1 (201) 719.7210

LONDON
17 Devonshire Square
4th Floor
London, EC2M 4SQ UK
+44 (0) 20 7397.9630

HONG KONG
The Center
99 Queen's Road Central
Office No. 5510
55th Floor
Central, Hong Kong SAR,
China
+852 3168.1532