

IMPACT IVM Guideline

Identification

Valuation

Management



IMPACT IVM Guideline

CSES



IMPACT IVM
Guideline

CSES

Foreword

With a growing emphasis on corporate ESG, a great amount of money is flowing into ESG funds. Impact funds, which mainly invest in start-ups, are said to have \$404 billion (as of 2020) under management. I am glad that so much money is being invested to create social value.

These funds, however, should not just have their names as such. Just as they manage their returns, they must manage their impacts as well. This brings about a need to define the impact a fund aims at and to precisely measure its magnitude.

In response to the growing demand for the measurement and management of impact investment performance, the Center for Social Value Enhancement Studies (CSES) has been conducting 『Impact IVM (Identification, Valuation, Management) research』 to establish their operational principles and methods. With an approach that can quantitatively estimate impacts, we have been trying to produce a practical guideline that can be used directly by practitioners in the investment field while following the method agreed and used by global leading impact investment institutions in the impact fund network

This guideline attempts to refine the way of defining impacts and measure standardized social value that can be boldly put into practice. It seeks to explore innovative methods to help spread value through impact investment. We hope that the IVM guideline will be used not only by impact funds but also by ESG funds, thereby facilitating the growth of startups and social ventures and snowballing impacts to brighten up our society.

2022. 4.

Head of CSES Suk-Kwon Na

Table of Contents

Identification

Valuation

Management

Part. 1

Impact Valuation Research

01	Research Background	10
02	Overview of Impact IVM Guideline	13

Part. 2

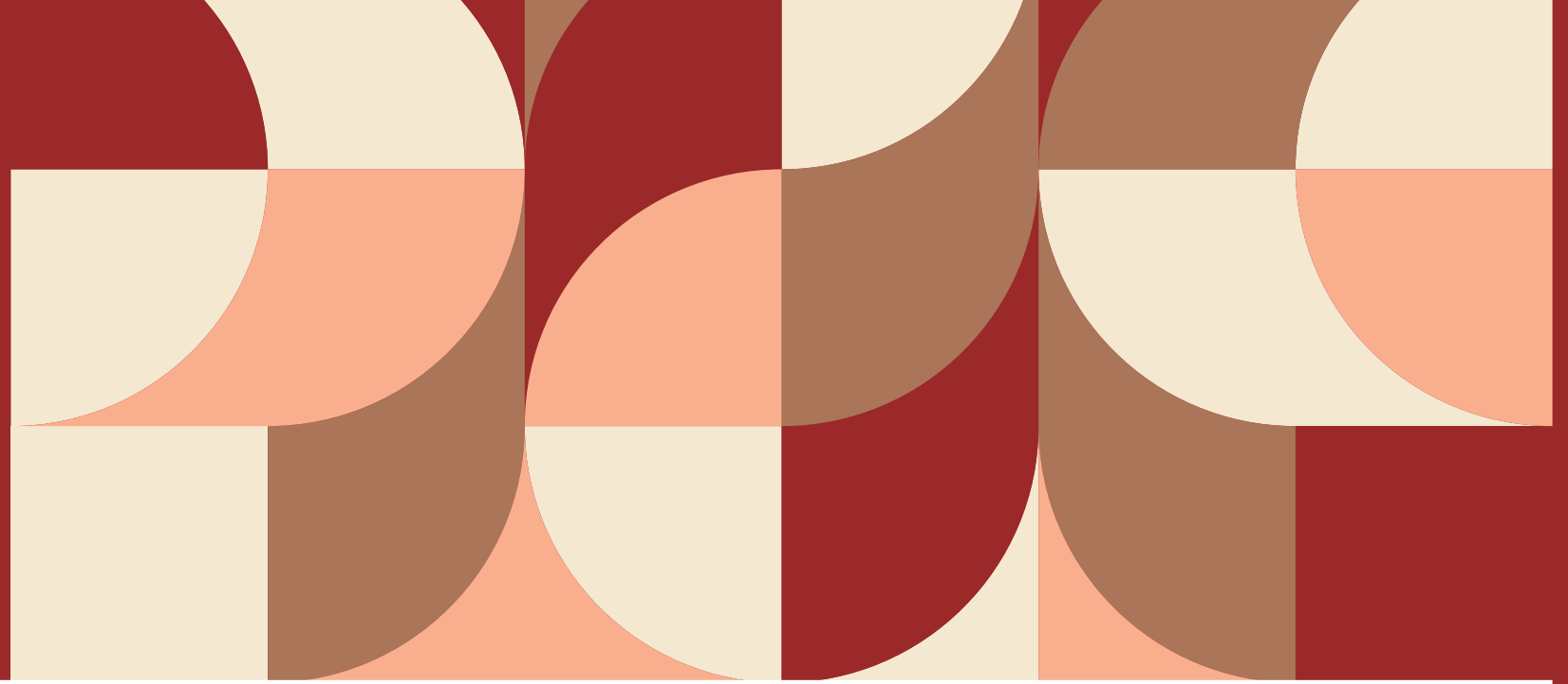
Impact IVM Guideline User Manual

01	Introduction	28
02	Impact Identification	30
03	Impact Valuation	39
04	Impact Management	56

Impact IVM Guideline User Manual

APPENDIX

01	Risk prevention scores	62
02	World Bank country groups by income	65
03	Country Risk Premium	67
04	Calculation of RDR for post-exit valuation period	69
05	Calculation of post-exit value and final impact value	70



Impact Valuation Research

01	Research Background	10
02	Overview of Impact IVM Guideline	13

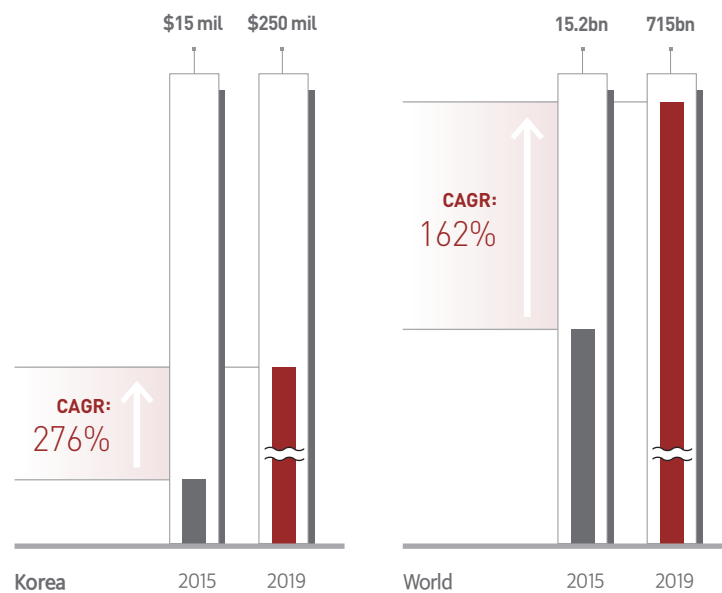


01

Research Background

Growth of global impact investment

- Globally, impact investments increased to \$715 billion in 2019¹⁾
- In Korea impact investments increased to about \$250 million in 2019²⁾

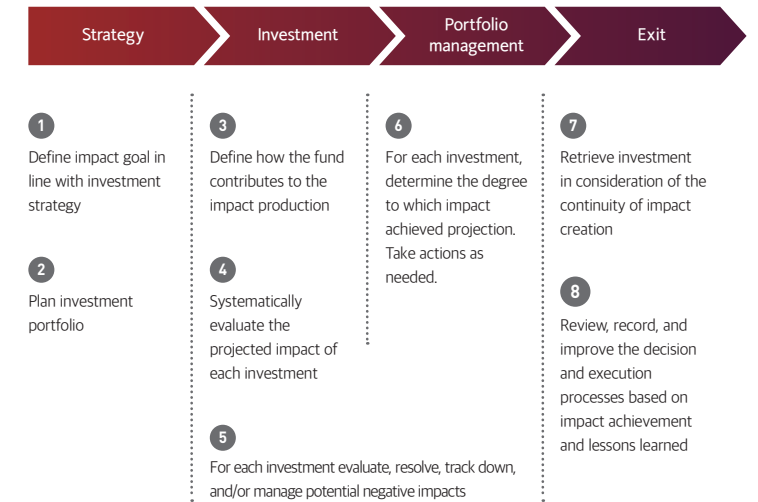


1) Annual Impact Investor Survey 2016 & 2020, GIIN

2) CSES estimate based on data from Korea Growth Investment Corp, Korea Venture Investment Corp, impact investors, etc.

Demand for impact measurement and management method

- Rising interest in impact investment increases the demand for principles and methods of measuring and managing impact investment performance.
- In August 2021, IFC announced 'Operating Principles for Impact Management',³⁾ which has been supported by 135 institutions so far.



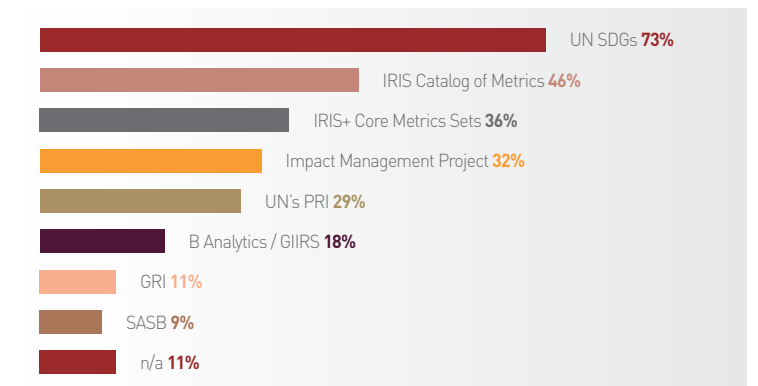
Independent inspection

- 9. Disclose how far in line with the operating principle the investment was made, and conduct regular and independent inspections on this issue

3) The Operating Principles for Impact Management, IFC (www.impactprinciples.org/9-principles)

Current impact measurement and management by global impact investors

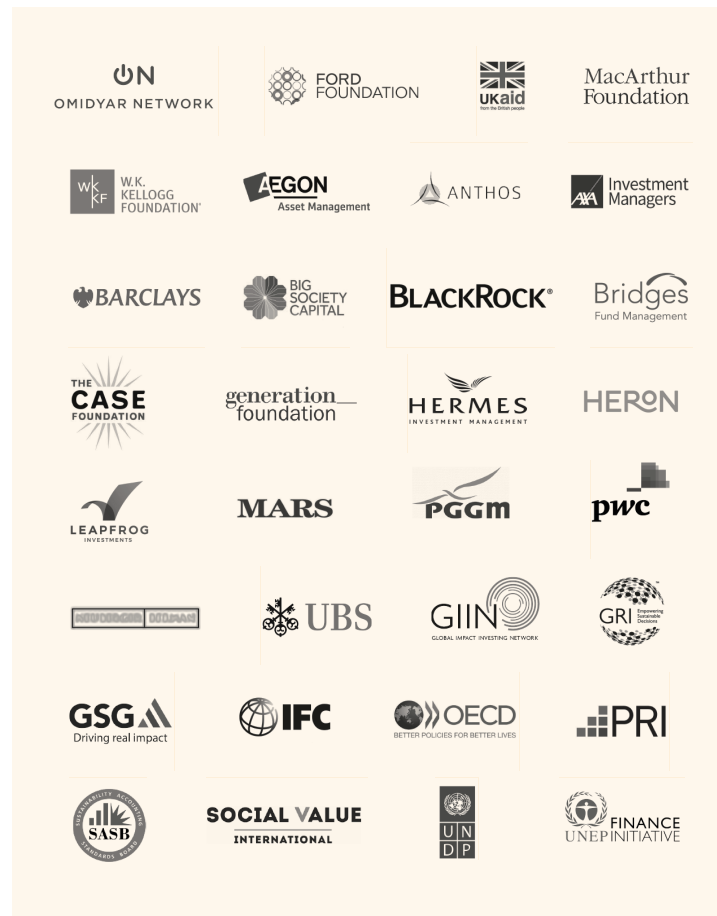
- Based on whether impacts are linked to SDGs, or using external impact measurement and management tools such as IRIS and IMP



Based on answers from 294 impact investors who responded to the Impact Investor Survey (in "select all that apply" format)

Efforts to standardize impact measurement and management

- There is a growing need in the field of impact investment to address the ambiguity and complexity of terms and measurement and management methods and to improve their comparability.⁴⁾
- In 2016, 2000 impact investment organizations formed the global consultative body IMP⁵⁾ to standardize the concepts of impact investment and the approach to impact measurement and management.



4) UBS Investor Watch "Return on values", 2018

5) Impact Management Project (<https://impactmanagementproject.com>)

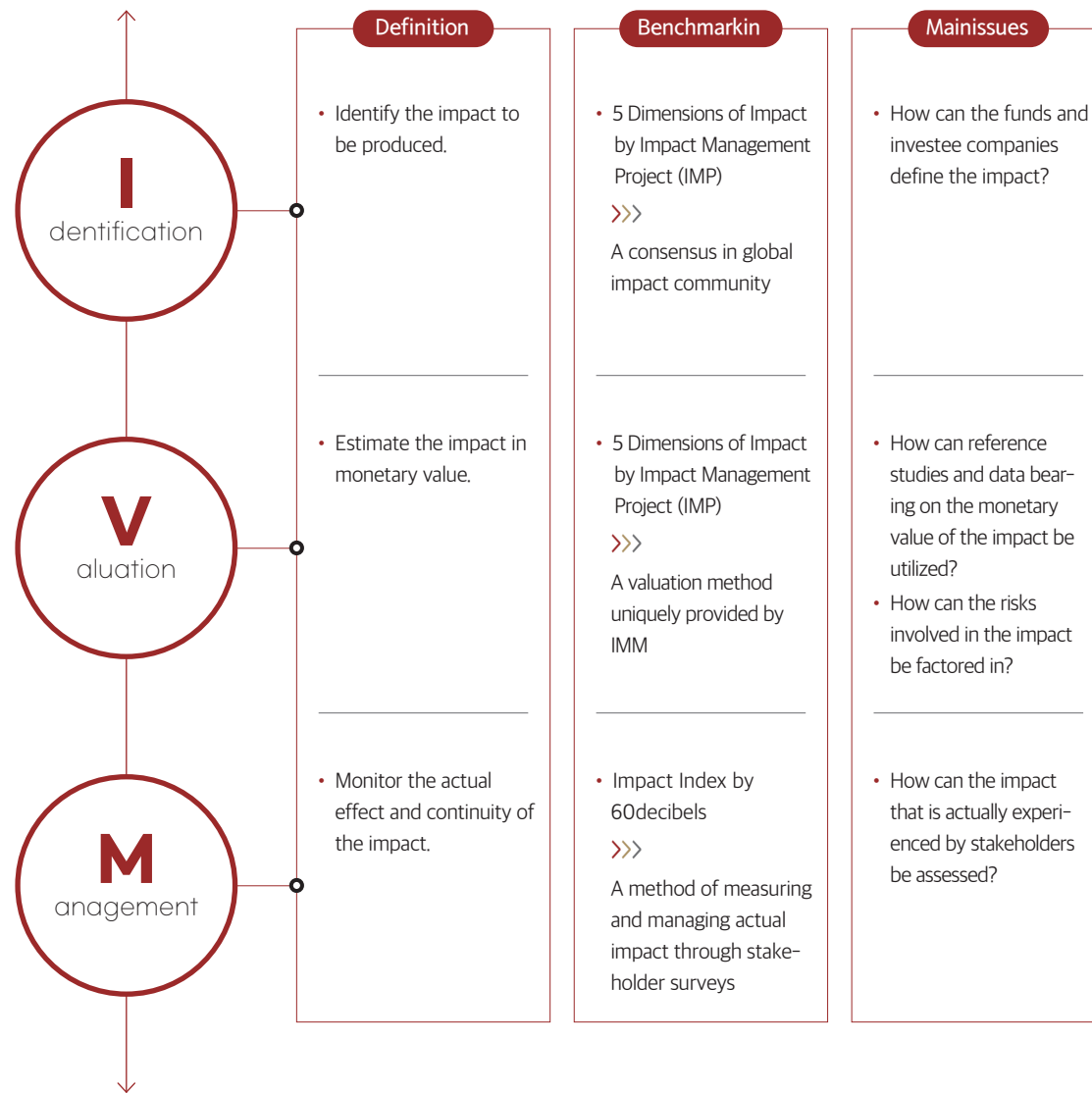
02

Overview of Impact IVM Guideline



Overview

Impact IVM Guideline has developed a method and guideline for Impact measurement and management by dividing the stages of Identification, Valuation, and Management (IVM)



Stakeholders should continue their communication while repeating the steps of impact Identification, Valuation, and Management.

Identification

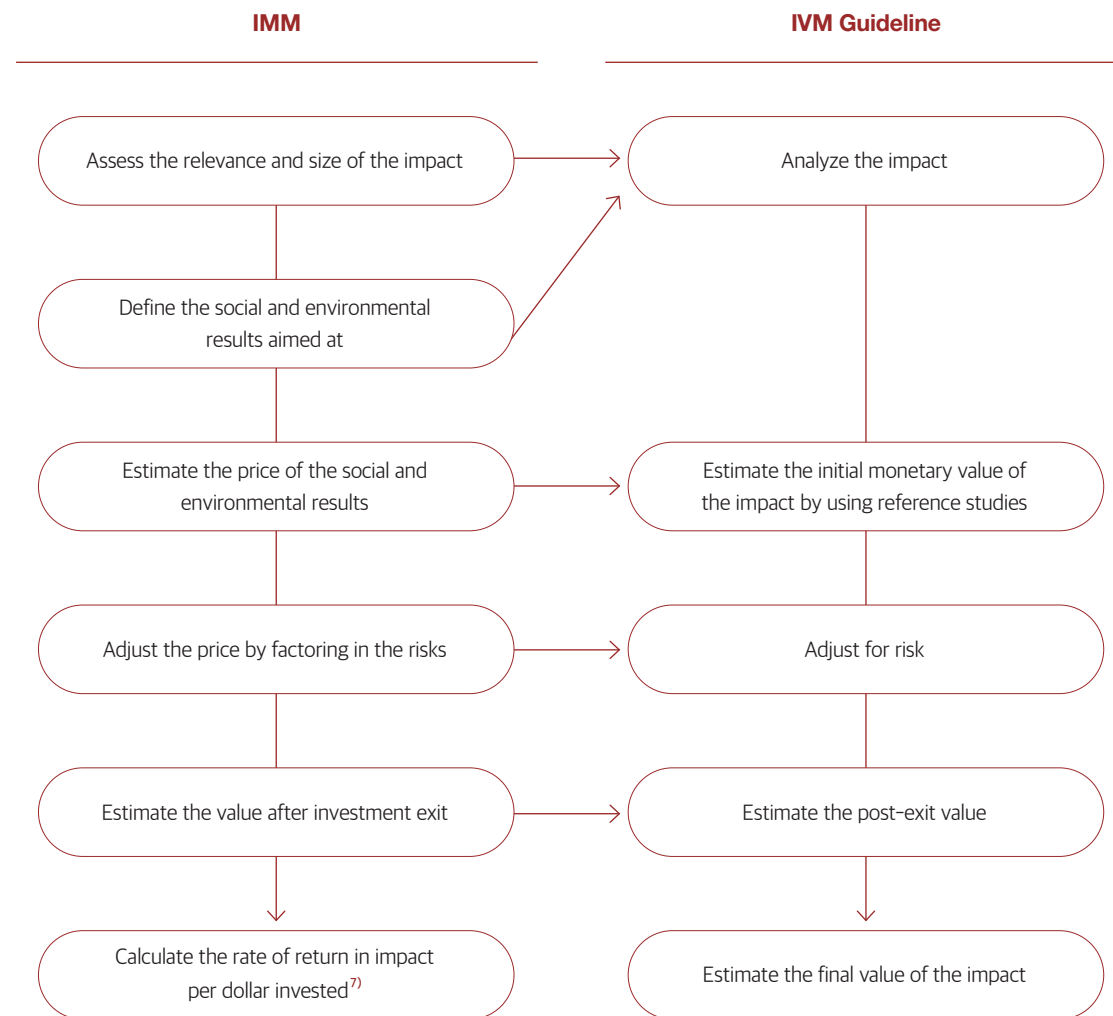
The Identification stage aims to define the impacts to be produced by the company through its product and establish impact KPI (Key Performance Index) by using the 5 Dimensions of Impact Management Project (IMP).

Impact Identification for Lumir, an SPC ⁶⁾ company		
Dimensions	Factors	Details
1. What	1-1 Outcome	LReduction in carbon monoxide emission through the use of Lumir K (LED lamp)
	1-2 Outcome Level in Period	One Lumir K unit emits 11mg/h of carbon monoxide
	1-3 Outcome Threshold	A Kerosene lamp emits 1132 mg/h of carbon monoxide
	1-4 Importance of Outcome to Stakeholder	The use of kerosene lamps generates a large amount of air pollutants such as carbon monoxide
	1-5 SDGs and/or IRIS+ Impact Theme	SDGs: Goal 7 - Affordable and Clean Energy IRIS+ Impact Theme: 8. Energy - Clean Energy
2. Who	2-1 Stakeholder	Residents who use kerosene lamps due to low electricity penetration
	2-2 Geographical Boundary	Villages with low electricity penetration in the region
	2-3 Outcome Level at Baseline	Kerosene lamp's carbon monoxide emission × number of households
	2-4 Stakeholder Characteristics	Monthly household income in the region is Rp 1,704,000
3. How Much	3-1 Scale	In the region 410,000 people have no access to electricity
	3-2 Depth	Using one Lumir K reduces carbon monoxide by 1121mg/h
	3-3 Duration	The average lifespan of a Lumir K is 50,000 hours
4. Contribution	4-1 Depth & Duration Counterfactual	Without Lumir K, a large amount of carbon monoxide will be emitted from the use of kerosene lamps until the Indonesian government establishes a power grid in the region
5. Risk	5-1 Risk Type & Level	The Indonesian government may establish a power grid and remove the need for Lumir K - Low

6) SPC (Social Progress Credit) is a project that measures in monetary value and rewards social enterprises' performance in solving social problems. It started in 2015 and was joined by 324 (cumulative) companies as of 2021.

Valuation (1/2)

The Valuation stage benchmarks the IMM⁷⁾ of The Rise Fund to estimate the monetary value of the impact expected to be created by a company in the future.



7) The Rise Fund invests when the impact return per dollar is \$2.5 or higher.

Valuation (2/2)

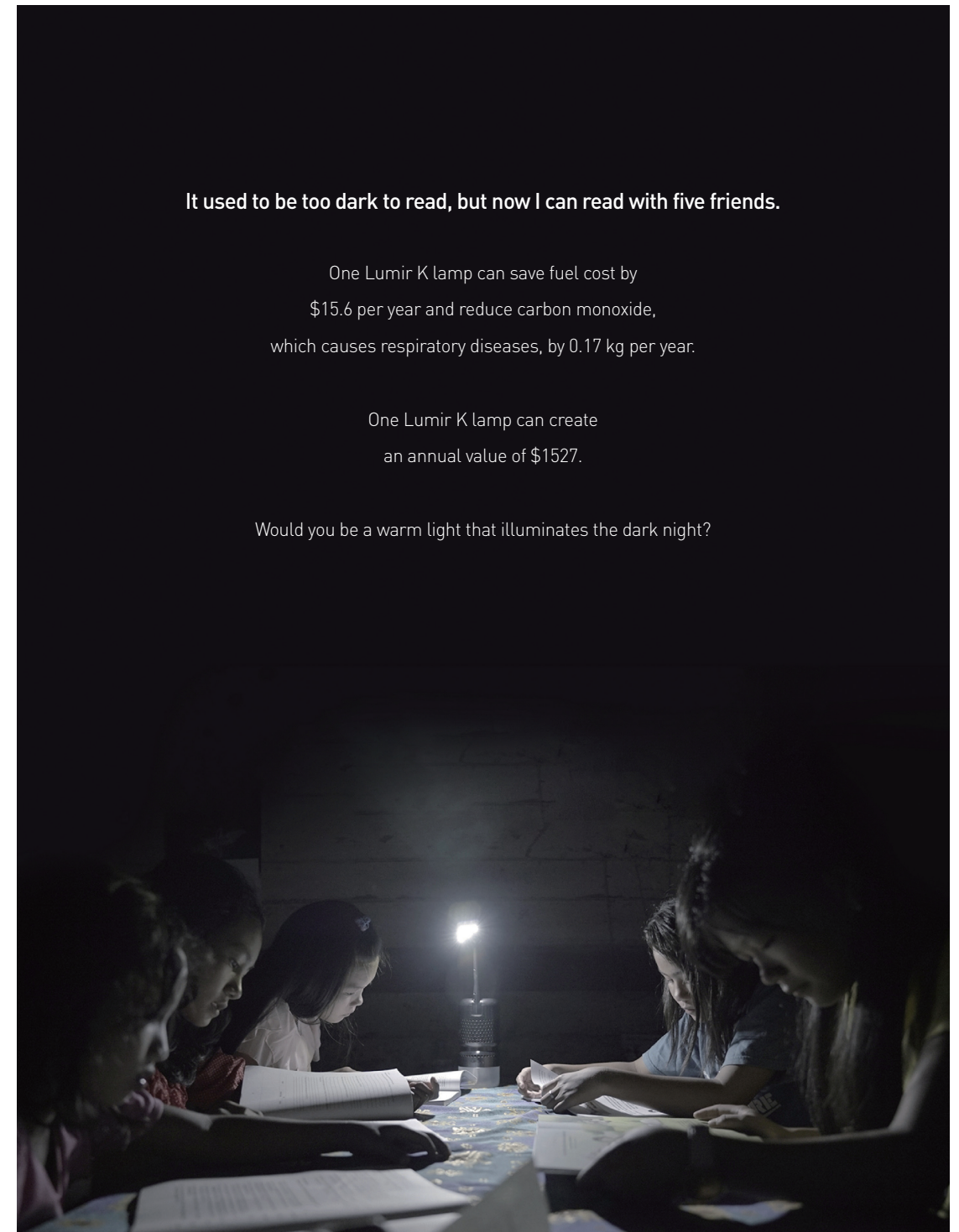
Impact Valuation for Lumir, an SPC company				
Steps	Factors	Impact 1	Impact 2	Impact 3
1. Analyze impact	1-1 What	<ul style="list-style-type: none"> Replace kerosene lamps with Lumir K → Fuel cost reduced → Disposable income increased 	<ul style="list-style-type: none"> Using Lumir K reduces CO₂ emission → Greenhouse gas reduced → Climate crisis addressed 	<ul style="list-style-type: none"> Using Lumir K reduces CO emission → Indoor air pollution reduced → Economic burden due to respiratory disease reduced
	1-2 Who	<ul style="list-style-type: none"> Households using Lumir K 	<ul style="list-style-type: none"> Earth 	<ul style="list-style-type: none"> Households using Lumir K
	1-3 How Much	<ul style="list-style-type: none"> Fuel cost reduction per Lumir K unit × units sold 	<ul style="list-style-type: none"> CO₂ reduction per Lumir K unit × units sold 	<ul style="list-style-type: none"> CO reduction per Lumir K unit × units sold
	1-4 Contribution	<ul style="list-style-type: none"> The possible suspension of the government subsidy for kerosene purchase in the absence of Lumir K and electricity will raise the fuel cost. 	<ul style="list-style-type: none"> Without Lumir K, high level of CO₂ emission will continue from kerosene lamp use. 	<ul style="list-style-type: none"> Without Lumir K, households using kerosene lamps will continue to be exposed to high a level of CO.
	1-5 Risk	<ul style="list-style-type: none"> Distribution network secured in collaboration with local conglomerates → Uncertainty about Lumir K distribution network - Low Local government's power grid supply slow → Danger of falling demand for Lumir K - Low 		
2. Calculate impact's initial value	2-1 Unit value based on reference study	<ul style="list-style-type: none"> Annual fuel cost reduction: USD 15.6/unit 	<ul style="list-style-type: none"> Annual CO₂ reduction: USD 1.7 / unit 	<ul style="list-style-type: none"> Reduction of economic burden due to respiratory disease: USD 564/unit
	2-2 Projected sales during investment	<ul style="list-style-type: none"> Expected sales volume of Lumir K during investment (5 years): 1,725,000 units 		
	2-3 Initial impact value	<ul style="list-style-type: none"> USD 28,596,855 	<ul style="list-style-type: none"> USD 3,874,817 	<ul style="list-style-type: none"> USD 1,034,804,150
3. Adjust for risk	3-1 Risks and discount rates	<ul style="list-style-type: none"> Risk prevention score: 59 RDR for investment period: 4.74% 	<ul style="list-style-type: none"> Risk prevention score: 49 RDR for investment period: 5.24% 	<ul style="list-style-type: none"> Risk prevention score: 47 RDR for investment period: 5.34%
	3-2 Adjusted impact value	<ul style="list-style-type: none"> USD 23,698,176 	<ul style="list-style-type: none"> USD 3,150,005 	<ul style="list-style-type: none"> USD 838,024,767

Steps	Factors	Impact 1	Impact 2	Impact 3
4. Calculate post-exit value	4-1 RDR for post-exit valuation period	<ul style="list-style-type: none"> Investment period RDR: 4.74% Weighted average cost of capital: 0.76% Post-exit valuation period RDR: 2.75% 	<ul style="list-style-type: none"> Investment period RDR: 5.24% Weighted average cost of capital: 0.76% Post-exit valuation period RDR: 3% 	<ul style="list-style-type: none"> Investment period RDR: 5.34% Weighted average cost of capital: 0.76% Post-exit valuation period RDR: 3.05%
	4-2 Post-exit impact value	<ul style="list-style-type: none"> Term: 5 years USD 61,946,726 	<ul style="list-style-type: none"> Term: 5 years USD 8,333,035 	<ul style="list-style-type: none"> Term: 5 years USD 2,222,194,387
5. Calculate final impact value	5-1 Final impact value	• USD 72,840,480	• USD 9,605,046	• USD 2,551,254,000
	Grand total	USD 2,633,699,525		

RDR: risk discount rate



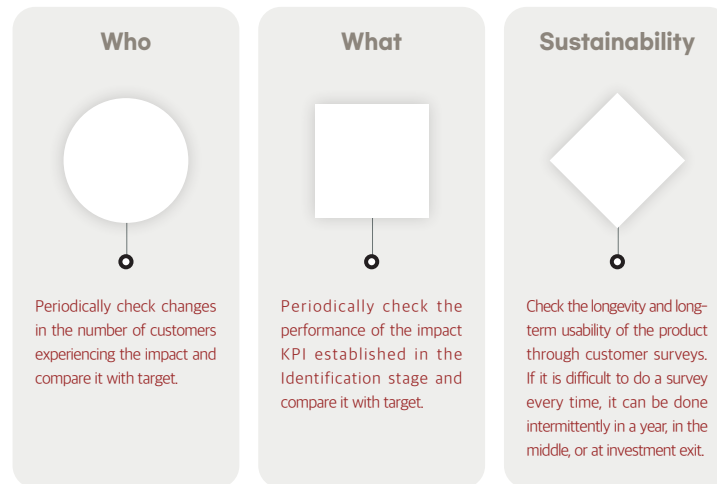
Referen Lumir: an impact story



Management

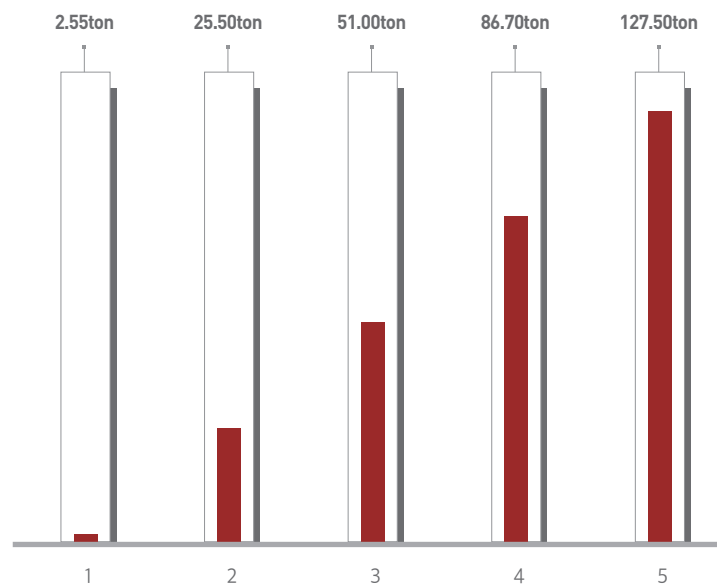
The Management stage benchmarks the Impact Index by 60 Decibels to monitor the performance of the impact KPI established in the Identification stage.

Management Framework



Example of Impact Management

• Yearly goals for CO reduction



Referen 1 IRIS⁹⁾ Catalog of Metrics by GIIN⁸⁾

A metrics for measuring the social, environmental, and financial performance of an impact investment

Categories	Details	Related data
Impact Category	• 17 impacts such as agriculture	• 643 data built that include definitions, explanations, and related reference materials for each item (as of June 2020).
SDGs	• 17 SDGs such as No Poverty	
Dimension of Impact	• What • Who • How Much Scale, Depth, Duration • Contribution Depth	
Operational Impact	• Environment Policies • Governance & Ownership • Social Policies & Performance	
Product Service Impact	• Quality and Performance • Quantity and Reach	
Focus	• Environmental • Social	
Investment Lens	• Gender • Geographic Setting • Minority and Disabled • Poverty Level • SMEs	
Financials	• Balance Sheet • Cash Flow • Income Statement • Other Financial	

8) Global Impact Investing Network

9) Impact Reporting and Investment Standard

Referen 2 Impact Management Project (IMP)

A forum to promote consensus on the method to measure and manage impacts, currently joined by over 2,000 related organizations including the Rockefeller Foundation¹⁰⁾

What is Impact?

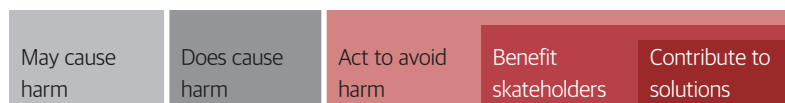
Impact is a change in an outcome caused by an organization.
An Impact can be a positive or negative, intended or unintended.

5 Dimension of Impact

Classifying an enterprise's impacts into A, B or C

Dimension	Assessment to look for...	Unknown	Important negative outcomes	Important negative outcome(s)	Important positive outcome(s)	Important positive outcome(s)
What		Unknown	Important negative outcomes	Important negative outcome(s)	Important positive outcome(s)	Important positive outcome(s)
Who		Unknown	Various	Underserved	Various	Underserved
How Much	Depth	Unknown	Various	High degree of positive change	Various	High degree of positive change and/or
	Scale	Unknown	Various	Various	Various	For many and
	Duration	Unknown	Various	Various	Various	Long-term
Contribution		Unknown	Various	Likely the same or better	Likely the same or better	Likely better
Risk		Unknown	Various	Various	Various	Various

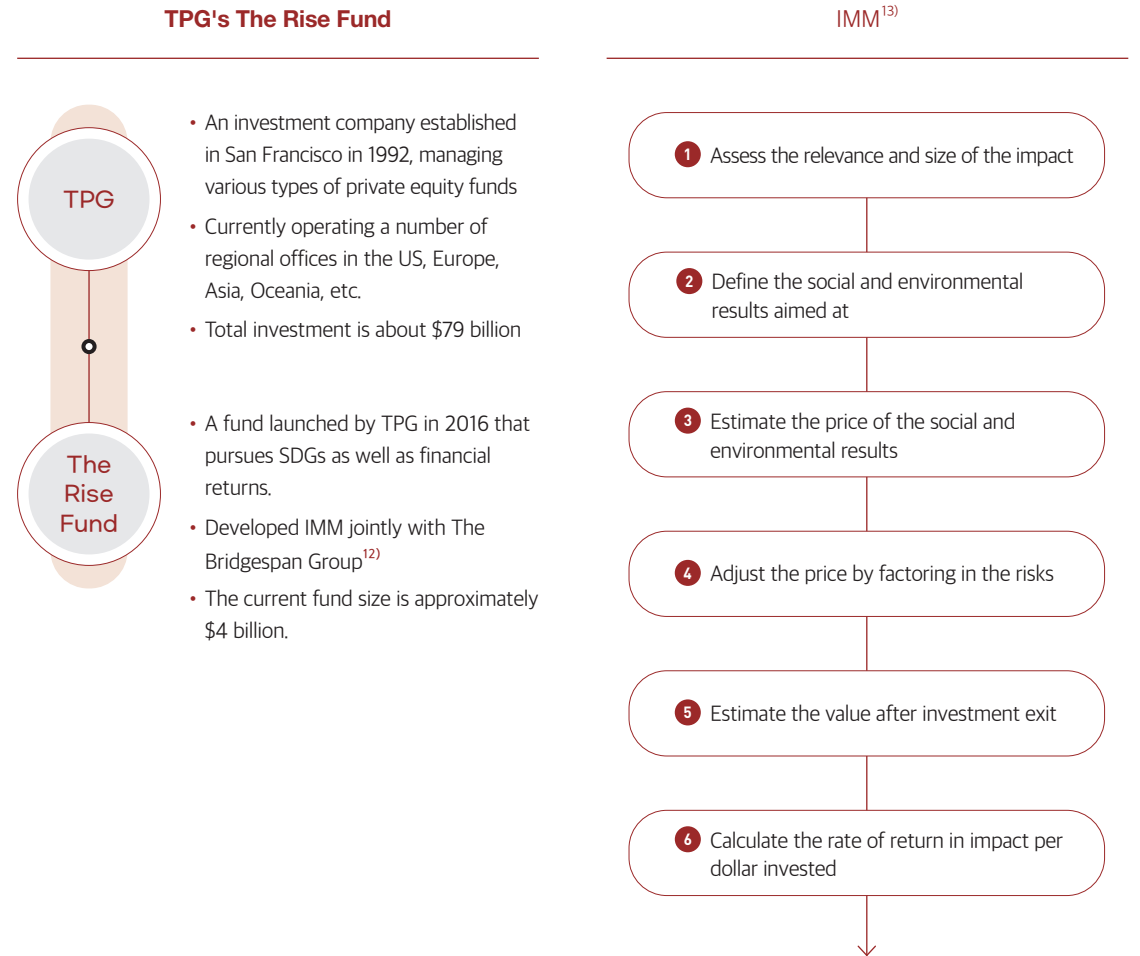
Classification of Impact



10) Impact Management Project (<https://impactmanagementproject.com>)

Referen 3 Impact Multiple of Money (IMM) by The Rise Fund

Among the global impact investors, TPG's The Rise Fund does impact valuation using IMM.¹¹⁾



11) According to the CSES analysis of the 19 investment companies, among the GII members, that has a median \$29 million or more of asset under management and disclosed their impact measurement method

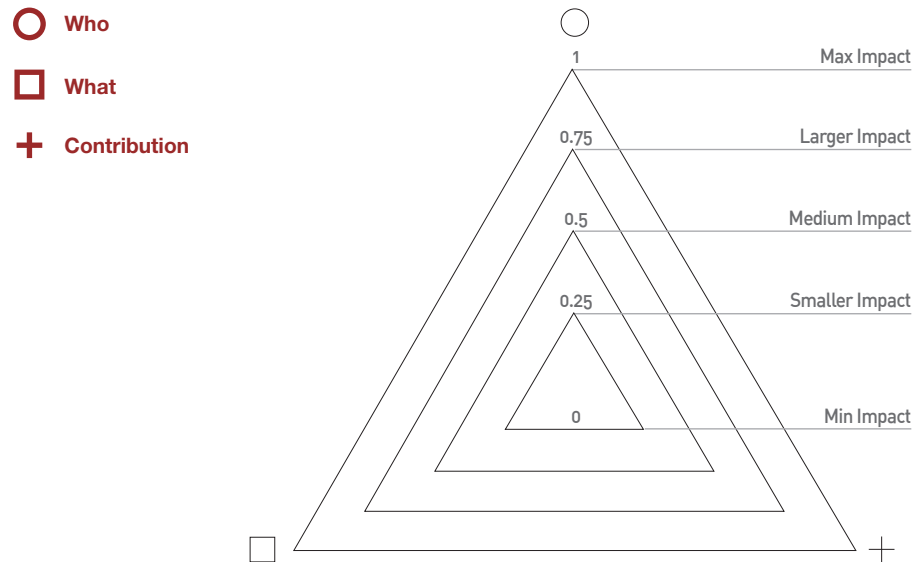
12) A management consulting group for non-profit organizations that started as pro bono from Bain & Company

13) <https://hbr.org/2019/01/calculating-the-value-of-impact-investing>

Referen 4 Impact Index by 60 Decibels

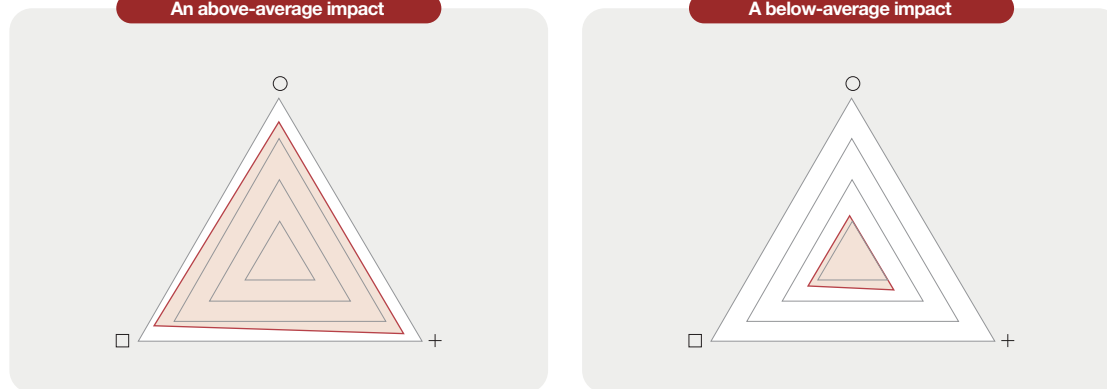
60 Decibels¹⁴⁾ uses Impact Index to measure and compare impacts a company's product has on the stakeholders

Impact Index



An above-average impact

A below-average impact



14) As an independent impact measurement institution that spun off from a US non-profit impact fund, it has developed Lean Data, which measures impacts in developing countries by using phone text messages, and has carried out 641 Lean Data projects in 43 countries in 77 languages.

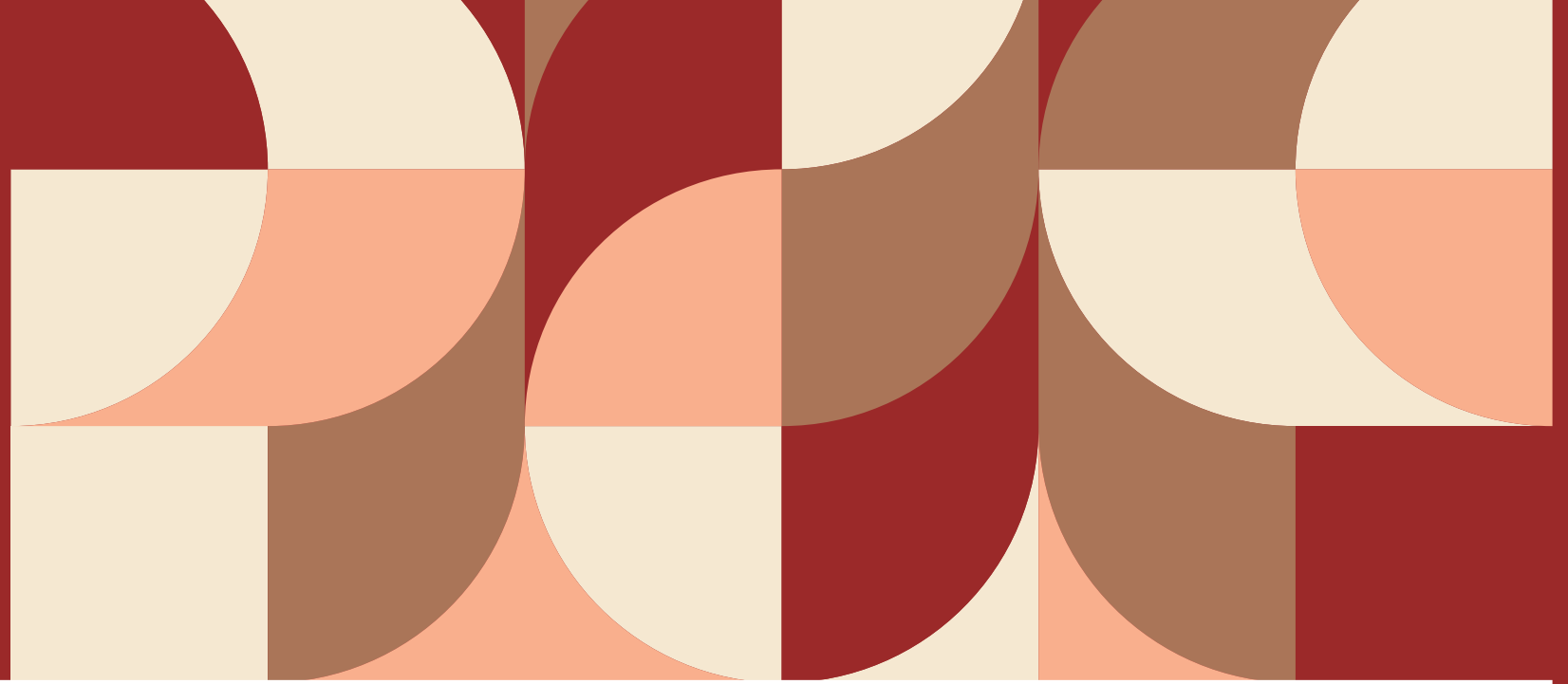
Referen 5 UN SDGs and IRIS+ Impact Theme

UN SDGs



IRIS+ Impact Theme





Impact IVM Guideline User manual

01	Introduction	28
02	Impact Identification	30
03	Impact Valuation	39
04	Impact Management	56

2

01

Introduction

Background of Impact IVM guideline

CSES (The Center for Social value Enhancement Studies) provides advice to impact investment funds regarding the measurement of the social impacts of investee companies.

As we operate the SPC (Social Progress Credit) system, which measures the social value of social enterprises, and the DBL (Double Bottom Line) system, which measures the social value of SK affiliates, we have been using them to measure the social value produced by investee companies in monetary terms.

However, as both the SPC and DBL systems "post-measure" the past social value created by companies, it was difficult for them to "pre-estimate" the social value to be created in the future. To improve this, we have developed the Impact IVM (Identification, Valuation, Management) Guideline, which can recognize, estimate, and manage impacts created by companies throughout the entire investment process including due diligence → deliberation → follow-up management.

Impact IVM Guideline is a tool to facilitate smooth communications among investors (LP), funds (GP), and companies with consistent language and bring efficiency to impact measurement and management. To facilitate the external communication of measurement results, the guideline follows as much as possible the agreed methods in global impact investment communities such as Impact Management Project (IMP). Many of its sections are presented in a workbook style inviting your hands-on engagement.

The data used in the examples are the result of a pilot measurement conducted with Lumir, a company participating in CSES' SPC project, to assess the usability of the IVM guideline. The pilot data are provided with Lumir's consent to aid the understanding of the guideline.



02

Impact Identification

Overview

Impact Identification recognizes and defines the impact created through a company's business activities. The purpose of this stage is to establish an Impact KPI (Key Performance Index) by identifying the area, type, beneficiaries, and scope of the impact. As a tool to set impact KPI, the guideline uses the 5 Dimensions of Impact, agreed by over 2200 organizations in the IMP.

The 5 Dimensions of Impact analyzes the characteristics of impact in five dimensions (What, Who, How Much, Contribution, and Risk) as follows.

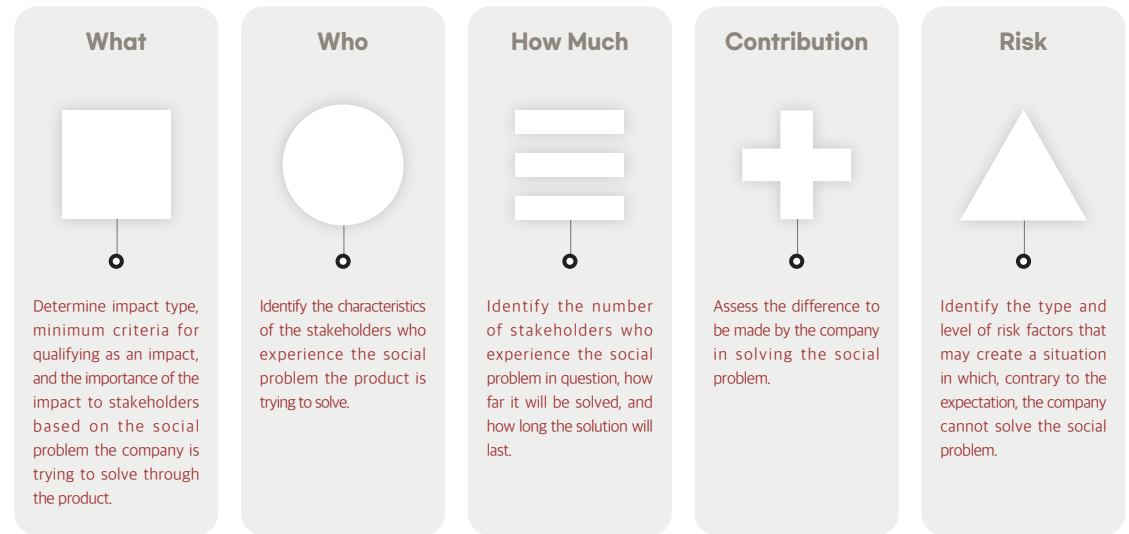


Table 1 | Impact Identification

Dimensions	Factors	Details
1. What	1-1 Outcome	The solution the company's product seeks to provide to the social problem
	1-2 Outcome Level in Period	The level of outcome produced in a given period of using the product
	1-3 Outcome Threshold	Minimum criteria for recognizing the outcome as positive
	1-4 Importance of Outcome to Stakeholder	Importance of solving the social problem for the core stakeholders
	1-5 SDGs and/or IRIS+ Impact Theme	The UN SDG and/or IRIS+ Impact Theme under which the social problem falls
2. Who	2-1 Stakeholder	Stakeholders who experience the social problem
	2-2 Geographical Boundary	Geographic location of the stakeholders
	2-3 Outcome Level at Baseline	Degree to which the stakeholders experience the social problem before the introduction of the product
	2-4 Stakeholder Characteristics	Demographic, socioeconomic, and behavioral characteristics of the stakeholders

Dimensions	Factors	Details
3. How Much	3-1 Scale	The number of stakeholders experiencing the product's impact or the sales volume of the product
	3-2 Depth	The difference to be made after the product introduction
	3-3 Duration	The period during which the impact is expected to last
4. Contribution	4-1 Depth Counterfactual	How far the social problem would be solved without the product, under the current alternatives in the market and the existing social system and policies
	4-2 Duration Counterfactual	How long the social problem might last without the product, under the current alternatives in the market and the existing social system and policies
5. Risk	5-1 Risk Type	<ul style="list-style-type: none"> Type of risk factors that create a situation in which, contrary to the expectation, the company cannot solve the social problem
	5-2 Risk Level	<ul style="list-style-type: none"> Level of risk factors that create a situation in which, contrary to the expectation, the company cannot solve the social problem



What

Consider the following five factors to understand the “What” of the impact.

Table 2 What		
Dimension	Factors	Detail
What	Outcome	The solution the company's product seeks to provide to the social
	Outcome Level in Period	The level of outcome produced in a given period of using the product
	Outcome Threshold	Minimum criteria for recognizing the outcome as positive
	Importance of Outcome to Stakeholder	Importance of solving the social problem for the core stakeholders
	UN SDGs and IRIS+ Impact Theme	The UN SDG and/or IRIS+ Impact Theme under which the social problem falls

1 Outcome

Describe the solution the product seeks to provide to the social problem

Example

Reduce CO₂ emission by replacing Kerosene lamps with Lumir K lamps.

2 Outcome Level in Period

Enter the level of outcome produced in a given period of using the product.

Example

One Lumir K unit emits 11mg/h of carbon monoxide.

3 Outcome Threshold

Enter the minimum criteria for recognizing the outcome as positive. The criteria can be standard-based or outcome-based.

Example

- Standard-based: Official, (inter-)nationally established criteria: minimum monthly cost of living for a single-person household in Korea/KRW 100 million
- Outcome-based: criteria based on benchmarks or experimental results of the industry: annual CO₂ emission by kerosene lamp 397kg/unit (used 8 hours/day)

4 Importance of Outcome to Stakeholder

Describe the importance of solving the social problem from the viewpoint of the core stakeholders.

5 UN SDGs and IRIS+ Impact Theme

Select the UN SDG and/or IRIS+ Impact Theme under which the social problem falls.

Example

- Lumir K:
- SDGs: Goal 7. affordable and clean energy
 - IRIS+ Impact Theme: 8. Clean Energy

Who

Consider the following five factors to understand the “Who” of the impact.

Table 3 Who		
Dimension	Factors	Detail
Who	Stakeholder	Stakeholders who experience the social problem
	Geographical Boundary	Geographic location of the stakeholders
	Outcome Level at Baseline	Degree to which the stakeholders experience the social problem before the introduction of the product
	Stakeholder Characteristics	Demographic, socioeconomic, and behavioral characteristics of the stakeholders

1 Stakeholder

Classify the stakeholders who experience the social problem into two groups (core and overall). Depending on the social problem, the earth can be classified as a core stakeholder as in the example.

Example

- Core (direct) stakeholder: earth, Lumir K users
- Overall (indirect) stakeholder: neighbors of Lumir K users, Sellers of alternative lamps

2 Geographical Boundary

Enter the geographic location of the stakeholders who experience the social problem.

Example

Kalimantan region, Indonesia

3 Outcome Level at Baseline

Enter the degree to which the stakeholders experience the social problem before the introduction of the product.

Example

Annual CO₂ emission by kerosene lamp: 397kg/unit (used 8 hours/day)

4 Stakeholder Characteristics

Describe the demographic, socioeconomic, and behavioral characteristics of the stakeholders

Example

- Demographic: 1 million people in the unpowered areas of Kalimantan
- Socioeconomic: Low-income class with monthly income of Rp 1,430,000 or less
- Behavioral: Consumption pattern of repeatedly purchasing inexpensive products leads to the use of kerosene lamps despite the availability of alternative lighting.

How Much

Consider the following three factors to understand the “How Much” of the impact.

Table 4 | How Much

Dimension	Factors	Detail
How Much	Scale	The number of stakeholders experiencing the product's impact or the sales volume of the product
	Depth	The difference to be made after the product introduction
	Duration	The period during which the impact is expected to last

1 Scale

Enter the expected sales volume of the product within the investment period or the expected number of stakeholders using the product.

Example

1,725,000 units over 5 years

2 Depth

Enter the difference to be made after the product introduction.

Example

Annual CO₂ reduction of 350kg/unit

3 Duration

Enter how long the product is expected to last. If the product is a service, enter the period during which the service provider remains in service.

Example

Lumir K lifespan: 50,000 hours

+ Contribution

Consider the following five factors to understand the “Who” of the impact.

Table 5 | Contribution

Dimension	Factors	Detail
Contribution	Depth Counterfactual	How far the social problem would be solved without the product, under the current alternatives in the market and the existing social system and policies
	Duration Counterfactual	How long the social problem might last without the product, under the current alternatives in the market and the existing social system and policies

1 Depth Counterfactual

Describe how far the social problem would be solved without the product, under the current alternatives in the market and the existing social system and policies

Example

A government-led power grid construction project is under way until 2024, but Indonesia being an archipelago country is slowing it down (30% complete). Although portable generators can be used, their high price makes it difficult to expect a decrease in the number of households using kerosene lamps.

2 Duration Counterfactual

Describe how long the social problem might last without the product, under the current alternatives in the market and the existing social system and policies

Example

It is highly likely that the power grid project will be far from complete even in 2024. Hence, the heavy use of kerosene lamps in the unpowered regions is expected to continue even after 2024.

Risk

Risk is a situation that, contrary to the expectation, makes it difficult for the company to solve the social problem with its product. Consider the following two factors to understand the risk involved in the impact. These two factors may be merged together.

Table 6 Risk		
Dimension	Factors	Detail
Risk	Risk Type	Type of risk factors that create a situation in which, contrary to the expectation, the company cannot solve the social problem
	Risk Level	Level of risk factors that create a situation in which, contrary to the expectation, the company cannot solve the social problem

1 Risk Type

Describe the risks in terms of the nine risk types listed.

2 Risk Level

Mark the level of the risk in three labels (high, middle, low), with an explanation of the basis for the marking.

Example

Stakeholder Participation Risk – low

User feedback has been gathered through field tests since 2017, with 98% of the users saying they will continue to use Lumir K.

Execution Risk – low

A local distribution network has been secured, which substantiates the expectation to achieve the target sales volume within 5 years.

Risk Types

01 Evidence Risk

There may be no reasonable ground for solving the social problem

02 External Risk

External factors may hinder the solution of the social problem.

03 Stakeholder Participation Risk

The needs and expectations of the stakeholders may be wrongly understood or not considered at all

04 Drop-off Risk

The solution may not last long enough.

05 Efficiency Risk

The social problem may be solved with less resources than expected.

06 Execution Risk

The planned project may not be properly executed.

07 Alignment Risk

The company's business model may not be in line with the solution to the social problem.

08 Endurance Risk

The project may fail to continue long enough for the solution.

09 Unexpected Risk

An unexpected positive situation may arise and solve the social problem, or unexpected negative situation may arise to block its solution.

03

Impact Valuation

Overview

Impact Valuation estimates the impact a company will create in the future in terms of monetary value. Currently, most of the global impact funds do not estimate impacts in monetary terms. IMM (Impact Multiple of Money), developed jointly by The Rise Fund and The Bridgespan Group, is the only method that monetizes impacts.

Impact Valuation, which benchmarks IMM, estimates in monetary terms the 'impact to occur during the investment period' and 'the impact to occur during a set period after exit'. It proceeds in the following steps.



Through the above steps, make a maximally conservative monetary estimate of the impact the company will create in the future.

Analyze the impact

Set the positive change that can occur through the impact KPI established in the Identification stage as 'impact (What)'. Then, analyze the impact in terms of Who, How Much, Contribution, and Risk.

1 What

Set as 'impact' the positive change that can be brought by a long-term continuation of the outcome.

Example

If the impact KPI is 'reduction of CO₂ emission', set the impact as 'response to climate crisis' through greenhouse gas reduction.

If the impact KPI is 'reduction of CO emission', set the impact as the 'reduction of the economic burden due to respiratory diseases' through reduction of indoor air pollution.

2 Who

Define the stakeholders who will experience the impact.

Example

If the impact is response to climate crisis: Stakeholders: earth

If the impact is to reduce economic burden due to respiratory diseases: Stakeholders: households using Lumir K

3 How Much

In consideration of the monetary expression of impact aimed at by Valuation, set the formula for estimating the size and scale of the impact.

Example

If the impact is response to climate crisis:

Formula: CO₂ reduction per unit × sales volume

If the impact is to reduce economic burden due to respiratory diseases: Formula: economic burden reduced per unit × sales volume

4 Contribution

Describe the company's contribution to resolving the social problem by assessing the impact that is likely without the product.

5 Risk

Define risk as a situation in which the company's impact creation will not proceed as planned, and describe the types and levels of the risk.

Apply reference studies

In converting the impact to be produced during the investment period into monetary value, apply reference studies¹⁾ in the following steps.

1 Find reference studies

First, find reference studies that provide a quantitative basis for monetizing the impact. Search article search sites such as Google Scholar, American Economic Association; sites of international organizations including the UN; government research data sites such as the Environmental Policy Evaluation Institute; government agencies such as US Environmental Protection Agency (EPA); and carbon credit exchange sites.

2 Obtain unit value

Derive the monetary unit value for the impact based on the quantitative data found in the reference study, adjusted for inflation if necessary.

Example

Price of carbon credits certified for overseas business (KRW 37,600)

→ unit value for 'response to climate crisis' (CO₂ reduction): USD 1.7/unit

Economic burden of chronic obstructive pulmonary disease for adults 30 years or older: USD 454~881 (Arcenas, Agustin, et al. (2010))

→ unit value for 'reduction of economic burden due to respiratory disease': USD 564/unit

3 Make sales projection

Project number of customers or sales volume within the investment period by providing some ground.

1) High-quality references needed to translate an investee company's impact into monetary value

Example

Projected sales of Lumir K over the next 5 years: 1,725,000 units

Unit: Qty.

Product	2021	2022	2023	2024	2025
Lumir K	15,000	150,000	300,000	510,000	750,000

4 Calculate monetary value of the impact for investment period

Estimate the monetary value of the impact created during investment period by multiplying the unit value by the projected number of customers or sales volume within the period.

Example

Unit value for reduction of economic burden due to respiratory disease: USD 564 ~ 610.49

Projected 5-year sales of Lumir K: 1,725,000 units

Value of the impact: USD 1,034,804,150

Unit: USD

Year	2021	2022	2023	2024	2025	Total
Sales projection (㉠)	15,000	150,000	300,000	510,000	750,000	1,725,000
Unit value (㉡)	564	575.28	586.79	598.52	610.49	
Impact value (㉠×㉡)	8,467,379	86,367,266	176,189,223	305,512,113	458,268,169	1,034,804,150

Adjust for risk

The main purpose of risk adjustment is to adjust the impact value obtained above in consideration of the limitations of applying reference studies to the valuation and uncertainties that may arise in the company's efforts of impact creation.

The risk adjustment proceeds in the following steps.



Risk prevention score

The risk prevention score is derived through the risk adjustment system developed by CSES and external researchers (Professors Eunjung Yeo and Taehyun Kim) by benchmarking IMP's 5 Dimensions of Impact and the risk adjustment system of The Rise Fund's IMM.

The IVM guideline classifies the risk factors in five types as follows and assigns them the following points on a 100-point scale.

- 1 Quality of the reference study – 25
- 2 Product/project similarity – 25
- 3 Similarity in social and economic contexts – 20
- 4 Possibility of unexpected external variables – 20
- 5 Possibility of interruption of impact creation – 10

1 Quality of the reference study

The quality factor concerns the reliability of the reference study data, which has a large impact on the reliability of the estimated impact value.

Reference quality is scored separately for overseas and Korean studies. A study published in an overseas journal receives a score based on a 25-point scale according to the group to which it belongs among the four groups of SJR (SCImago Journal Rank), which shows the influence and importance of international journals.

In the case of a study published only in Korea, it receives a score based on an 18-point scale according to whether the journal in which it is published is listed as "registered with distinction", "registered", or "registration candidate" by the National Research Foundation of Korea. The journal rankings are available on the websites of SJR and the National Research Foundation of Korea²⁾.

2) www.scimagojr.com/journalrank.php
www.nrf.re.kr/biz/journal/view?menu_no=13

Overseas and Korean journals produce different scores because it is often the case that a study that is excellently evaluated in Korea is also published in an overseas journal. On the other hand, studies and materials that are not published in an academic journal are classified as 'Miscellaneous' and receive 8 points.

Table 7 | Scoring reference quality

Scores based on 4 groups of SJR	
25	Q1 (within top 25%)
20	Q2 (within 25~50%)
15	Q3 (within 50~75%)
10	Q4 (below 75%)
8	Miscellaneous (presentations by government departments or international organizations, corporate experiment data, etc.)
Scores based on National Research Foundation of Korea registration status	
18	Registered with distinction
14	Registered
10	Registration candidate
8	Miscellaneous (presentations by government departments, corporate experiment data, etc.)

Example

The reference study used for Lumir K's impact of reducing economic burden due to respiratory disease belongs to SJR Q4.

▶ Hence, reference quality score is 10.

2 Product/project similarity

Product/project similarity concerns the question of whether the impact made by the product will be comparable to the result of the reference study. It is scored on a 25-point scale, by summing a product similarity score and a project similarity score.

The product similarity score is obtained on a 15-point scale by comparing the product and the item used in the reference study by the goods and

services classification code³⁾ from Korean Intellectual Property Office. The code classifies goods and services with an alphabet G (goods) or S (service) followed by a 4~6-digit number. This code system can be used internationally as it follows the NICE Classification⁴⁾.

Project similarity is scored on a 10-point scale by considering the following three factors, which can make a difference in impact creation even when the product similarity is high:



However, this scoring is based on guideline user's own judgment rather than an objective standard.

Table 8 | Scoring product/project similarity

Product similarity	
15	The codes match in the alphabet and the first three digits.
10	The codes match in the alphabet and the first two digits.
5	The codes match in the alphabet and the first digit.
Project similarity	
10	Similar in three factors
7	Similar in only two factors
4	Similar in only one factor

Example

In the case of reduction of economic burden due to respiratory disease by Lumir K

<Product/project similarity score> - 0 (not similar)

- Reference study item: charcoal brazier, home wood stove: G2801
- The product: LED lamp: G3902

3) www.kipo.go.kr/kpo/HtmlApp?c=3089&catmenu=m04_02_02

4) A system established in accordance with the NICE Agreement on the international classification of goods and services for trademark registration. It was introduced in Korea after March 1, 1998 and became the standard for classification of goods and services.

<Project similarity score> - 7

- Similarity in project – not similar
 - Reference study: cooking fuels and cooking appliances
 - The product: lighting appliance
- Similarity in target users – similar
 - Reference study: all members of the household
 - The product: all members of the household
- Projected usage – similar
 - Reference study item: used everyday
 - The product: Used everyday in unpowered regions

▶ Hence, product/project similarity score is 7.

3 Similarity in social and economic contexts

Similarity in social and economic contexts matters because there is a possibility that differences in social and economic conditions (living habits, purchasing power, consumer behavior, etc.) between the country of the reference study and the country where the product is sold may result in the product making a different impact from the result of the reference study. Context similarity is scored by summing a social context similarity score and an economic similarity score, each obtained on a 10-point scale.

First, social context similarity is scored by comparing the urban population ratios of the country where the product is sold and the country of the reference study. The urban population ratios are available in World Bank Open Data.⁵⁾

Table 9 Scoring social context similarity	
Scores based on urban population ratio	
10	Difference in the urban population ratio is 10% or less
8	Between 11% and 20%
6	Between 21% and 30%
2	Between 31% and 40%
0	41% or more

5) <https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS>

Example

In the case of reduction of economic burden due to respiratory disease by Lumir K

- Country of reference study: Indonesia
- Country of Lumir K sales: Indonesia
- The two countries are identical, which means no difference in urban population ratio

▶ Hence, social context similarity score is 10.

Economic context similarity is scored by using the World Bank country groups by income.⁶⁾

- Low Income Economy: GDP per capita USD 1,035 or less
- Lower-middle Income Economy: USD 1,036~USD 4,045
- Upper-middle Income Economy: USD 4,046~USD 12,535
- High Income Economy: USD 12,536 or higher

For the countries belonging to each group, refer to Appendix 2. However, for up-to-date grouping, check the World Bank website.

Table 10 Scoring economic context similarity	
Scores based on country grouping	
10	In the same group
7	1-level difference in grouping
4	2-level difference in grouping
1	3-level difference in grouping

6) <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-country-and-lending-groups>

Example

In the case of reduction of economic burden due to respiratory disease by Lumir K

- Country of reference study: Indonesia
- Country of Lumir K sales: Indonesia

- ▶ Hence, social context similarity score is 10.
- ▶ Context similarity score is 20.

4 Possibility of unexpected external variables

Unexpected external variables such as sudden political or social developments of the project country can create a situation where the product cannot be sold or can no longer be used. This possibility is measured by the external variable score, which is obtained on a 20-point scale by using Country Risk Premium, an investment guide developed based on each country’s macroeconomic situation and political system.

The guideline takes the Country Risk Premium data from the website⁷⁾ of NYU Professor of Finance Aswath Damodaran, famous author of Narrative and Numbers. The data is available in Appendix 3 as well, but it may not be up to date at the time of guideline use.

Table 11 | Scoring possibility of external variable

Scores based on Country Risk Premium

20	Country Risk Premium - $0 < 0.35\%$ (top 25%)
15	Country Risk Premium - $0.35\% < 0.77\%$
10	Country Risk Premium - $0.77\% < 1.5\%$ (bottom 25%)
5	Country Risk Premium - $> 1.5\%$

Example

- Country Risk Premium for Indonesia is 1.84%

- ▶ Hence, external variable score is 5

7) http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html

5 Possibility of interruption of impact creation

An early deterioration or death of a product can interrupt its function of impact creation. Interruption possibility is scored by comparing the average lifespan of the product and that of its competing products.

If the average lifespan of its competing products is unavailable, produce a score by making a judgment on the prospect of the product and the characteristics of its impact.

Table 12 | Scoring interruption possibility

Scores based on a comparison of average lifespan

10	The product’s average lifespan is longer than competition by 90% or more
9	Longer than competition by 70~89%
8	Longer than competition by 50~69%
7	Longer than competition by 30~49%
6	Longer than competition by 10~29%
5	Same as competition or shorter by 1~9%
4	Shorter than competition by 0~29%
3	Shorter than competition by 30~49%
2	Shorter than competition by 50~69%
1	Shorter than competition by 70%

Example

In the case of Indonesia

- Average lifespan of existing LED lamps: 50,000 hours
- Average lifespan of Lumir K: 50,000 hours

- ▶ Hence, interruption possibility score is 5.

Risk prevention score

Sum up the scores for the five risk factors to obtain the risk prevention score.

Example

Risk prevention score for the reduction of economic burden due to respiratory disease by Lumir K: 47

- ① Reference quality score - 10
- ② Product/project similarity score - 7
- ③ Context similarity score - 20
- ④ External variable score - 5
- ⑤ Interruption possibility score - 5

Obtain RDR for the investment period

The RDR for the impact created during the investment period is derived using the risk prevention score and the maturity interest rate of the 20-year Korean government bond (2.19%, as of June 13, 2021).

First, place the risk prevention score obtained above in one of the risk prevention score intervals of <Table 13>. Then, subtract the RDR of the interval by 0.05% for every 1-point increase of the risk prevention score from the bottom of the interval.

If the interest rate has changed at the time of derivation, the new rate should be used. The RDR thus obtained is used in the next step to derive the cash flow of the future impact using the DCF method⁸⁾.

Table 13 | RDR calculation

Risk prevention score interval RDR	
90 or higher	20-year Korean government bond interest rate (2.19%)+1%
80 or higher	20-year Korean government bond interest rate (2.19%)+1.5%
70 or higher	20-year Korean government bond interest rate (2.19%)+2%
60 or higher	20-year Korean government bond interest rate (2.19%)+2.5%
50 or higher	20-year Korean government bond interest rate (2.19%)+3%
40 or higher	20-year Korean government bond interest rate (2.19%)+3.5%
30 or higher	20-year Korean government bond interest rate (2.19%)+4%
20 or higher	20-year Korean government bond interest rate (2.19%)+4.5%
10 or higher	20-year Korean government bond interest rate (2.19%)+5%

8) Discounted Cash Flow

Example

RDR for the reduction of economic burden due to respiratory disease by Lumir K

- Risk prevention score: 47
- RDR = 2.19% + 3.5% - (0.05% × 7)
- ▶ RDR = 5.34%

Obtain the cash flow of the impact to be created within the investment period

The cash flow of the impact to be generated by the company during the investment period is obtained in the following steps. ① Calculate the initial impact value for each year by multiplying product sales by the corresponding unit value. ② Adjust each initial value with RDR.

Example

Cash flow for the reduction of economic burden due to respiratory disease by Lumir K within the investment period

- Lumir K sales projection ①

Unit: Qty.

Year	2021	2022	2023	2024	2025	Total
Lumir K sales projection	15,000	150,000	300,000	510,000	750,000	1,725,000

- Unit value: USD 564 ~ 610.49 ②

- Initial impact value ③

Unit: USD

impact	2021	2022	2023	2024	2025	Total
Reduction of economic burden due to respiratory disease	8,467,379	86,367,266	176,189,223	305,512,113	458,268,169	1,034,804,150

- RDR: 5.34% ④

- Future cash flow

Unit: USD

	2021	2022	2023	2024	2025
Year (n)	1	2	3	4	5
Initial impact value (③)	8,467,379	86,367,266	176,189,223	305,512,113	458,268,169
Cash flow	8,038,142	77,832,780	150,729,896	248,116,232	353,307,716
Formula (③)/(1+④)^n	8,467,379/ (1+0.0534)^1	86,367,266/ (1+0.0534)^2	176,189,223/ (1+0.0534)^3	305,512,113/ (1+0.0534)^4	458,268,169/ (1+0.0534)^5

Obtain the post-exit value

Post-exit value is the monetary value of the impact to be created after investment exit. The results of Impact Valuation will change according to the period set for estimating post-exit value. IVM guideline limits the post-exit valuation period to 5 years in view of the relatively short lifespan (average of 6.2 years)⁹⁾ of social enterprises and social venture companies and low level of product awareness. The Rise Fund's IMM, a benchmark of the valuation method, also sets the post-exit valuation period to 5 years.

Some guideline users, however, may wish to set the period as permanent. Appendix 5 provides a formula for deriving post-exit value with a permanent period. Post-exit value is obtained in the following two steps.

- 1 Calculate RDR for post-exit valuation period
- 2 Calculate future cash flow for post-exit valuation period

1 Obtain RDR for post-exit valuation period

The RDR for the post-exit valuation period is calculated as the average between RDR for the investment period and the company's Weighted Average Cost of Capital (WACC).¹⁰⁾

The Weighted Average Cost of Capital is used here because it is a good indicator of whether the company will last, whether the product will continue to be sold, and whether the impact will continue to be created.

Example

Post-exit valuation period RDR for the reduction of economic burden due to respiratory disease by Lumir K

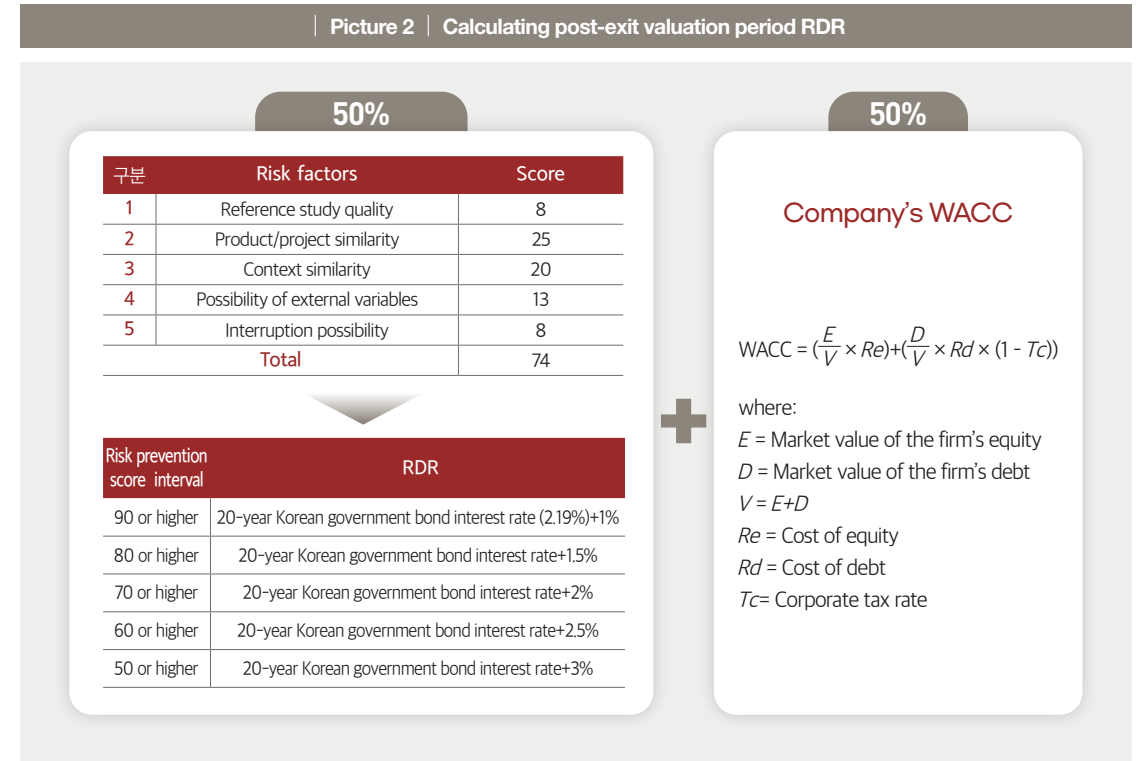
- Investment period RDR: 5.34%
- Weighted average cost of capital for Lumir K manufacturer: 0.76%

► Post-exit valuation period RDR : 3.05%[(5.34%+0.76%)/2]

9) 2020 Social Venture Survey Report, Ministry of SMEs and Startups

10) Financing cost calculated by using weights and according to capital type (other capital, equity capital). Used in estimating financial value.

Picture 2 | Calculating post-exit valuation period RDR



2 Calculate future cash flow for post-exit valuation period

With the post-exit valuation period set at 5 years, calculate the initial impact value for each year of the period by applying the post-exit valuation period growth rate to the initial impact value for the last year of the investment period. While this guideline sets the growth rate at 2%, it should be set according to the guideline user's unique situation.

Then, apply the post-exit period RDR to each initial value for the same period to derive the cash flow within the post-exit valuation period.

Example

Post-exit valuation period cash flow for the reduction of economic burden due to respiratory disease by Lumir K

- Initial impact value for last year of investment period: USD 458,268,169 ①
- Post-exit valuation period growth rate: 2% ②
- Post-exit valuation period RDR: 3.05% ③

• Cash flow within post-exit valuation period

Unit: USD

post-exit value					
Year	1	2	3	4	5
Initial impact value (④)	467,433,533	476,782,203	486,317,847	496,044,204	505,965,088
Formula (①×(1+②) ⁿ)	$458,268,169 \times (1+0.02)^1$	$458,268,169 \times (1+0.02)^2$	$458,268,169 \times (1+0.02)^3$	$458,268,169 \times (1+0.02)^4$	$458,268,169 \times (1+0.02)^5$
Cash flow	453,595,360	448,970,197	444,392,196	439,860,875	435,375,759
Formula (④/(1+③) ⁿ)	$467,433,533 / (1+0.0305)^1$	$476,782,203 / (1+0.0305)^2$	$486,317,847 / (1+0.0305)^3$	$496,044,204 / (1+0.0305)^4$	$505,965,088 / (1+0.0305)^5$
Total	2,222,194,387				



Estimate the final impact value

Add a new column (Post-exit) to the investment period cashflow table. Enter the total post-exit period cash flow in the column as the initial impact value. Apply the investment period RDR to the initial value to obtain the post-exit cash flow. Then calculate the final impact value by summing all cash flows.

Example

Final impact value for the reduction of economic burden due to respiratory disease by Lumir K: USD 2,551,254,000

- RDR for investment period: 5.34% ①
- Investment period cash flow table

	2021	2022	2023	2024	2025
Year	1	2	3	4	5
Initial impact value (A)	8,467,379	86,367,266	176,189,223	305,512,113	458,268,169
Cash flow (B)	8,038,142	77,832,780	150,729,896	248,116,232	353,307,716
Formula (B=A/((1+C) ⁿ)	$8,467,379 / (1+0.0534)^1$	$86,367,266 / (1+0.0534)^2$	$176,189,223 / (1+0.0534)^3$	$305,512,113 / (1+0.0534)^4$	$458,268,169 / (1+0.0534)^5$

- Total post-exit period cash flow: USD 2,222,194,387
- Final impact value

Unit: USD

	2021	2022	2023	2024	2025	Post-exit
Year (n)	1	2	3	4	5	5
Initial impact value (A)	8,467,379	86,367,266	176,189,223	305,512,113	458,268,169	2,222,194,387
Cash flow (B)	8,038,142	77,832,780	150,729,896	248,116,232	353,307,716	1,713,229,233
Formula (B=A/((1+C) ⁿ)	$8,467,379 / (1+0.0534)^1$	$86,367,266 / (1+0.0534)^2$	$176,189,223 / (1+0.0534)^3$	$305,512,113 / (1+0.0534)^4$	$458,268,169 / (1+0.0534)^5$	$2,222,194,387 / (1+0.0534)^5$
Final impact value	2,551,254,000					

04

Impact Management

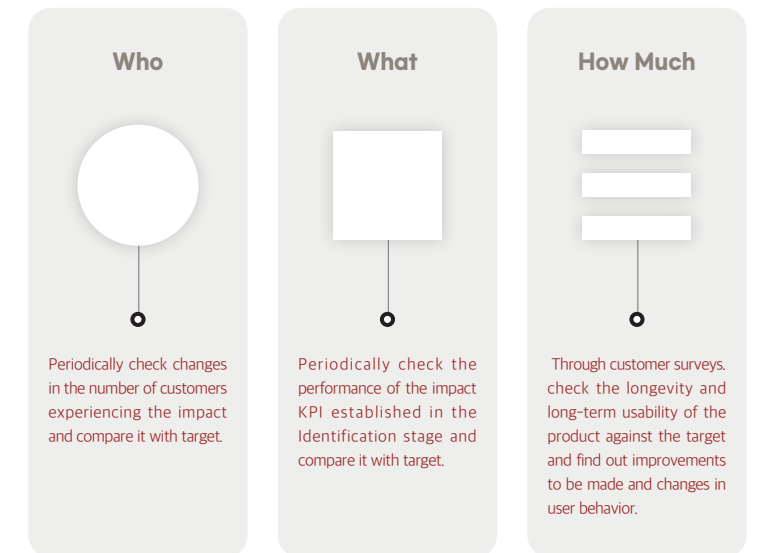
Overview

Impact Management monitors the performance of the impact KPI established in the Identification stage to make sure that the product is creating the impact as expected.



For Impact Management this guideline benchmarks the Impact Index by 60 Decibels. The Impact Index analyzes the data gathered through telephone user surveys in terms of the Who, What, How Much of the IMP 5 Dimensions of Impact to show the position of the investee company in relation to the industry benchmark.

Hence, Impact Management has the following three parts.



Periodically check changes in the number of customers experiencing the impact and compare it with target.

Periodically check the performance of the impact KPI established in the Identification stage and compare it with target.

Through customer surveys, check the longevity and long-term usability of the product against the target and find out improvements to be made and changes in user behavior.

To collect the How Much data, CSES did a customer survey with 60 Decibels.

A customer survey provides insights for impact investment by making it possible to check:

- Whether the assumptions made during investment review was correct.
- Whether the impact defined during investment review is actually materializing for customers.
- The longevity and long-term usability of the product as experienced by customers.

However, it can be difficult to allocate a large budget to the survey, so the How Much part can be done flexibly according to the guideline user's circumstances.

Who

The Who part records the size of customers defined in the Identification and Valuation stages in terms of the number of individuals or households according to the product. It tracks the number by month, quarter, and year, comparing it with the target number for the investment period.

Example

If the product is a cooking oil lamp, track the number of households using cooking oil lamps.

What

The What part records how far the social problem defined in the Identification and Valuation stages is actually solved. As in the Who part it tracks the performance number by month, quarter, and year, comparing it with the target number for the investment period.

Example

If the impact KPI is CO₂ emission reduction by Lumir K, track:
Lumir K sales volume x amount of CO₂ reduction per unit

How Much

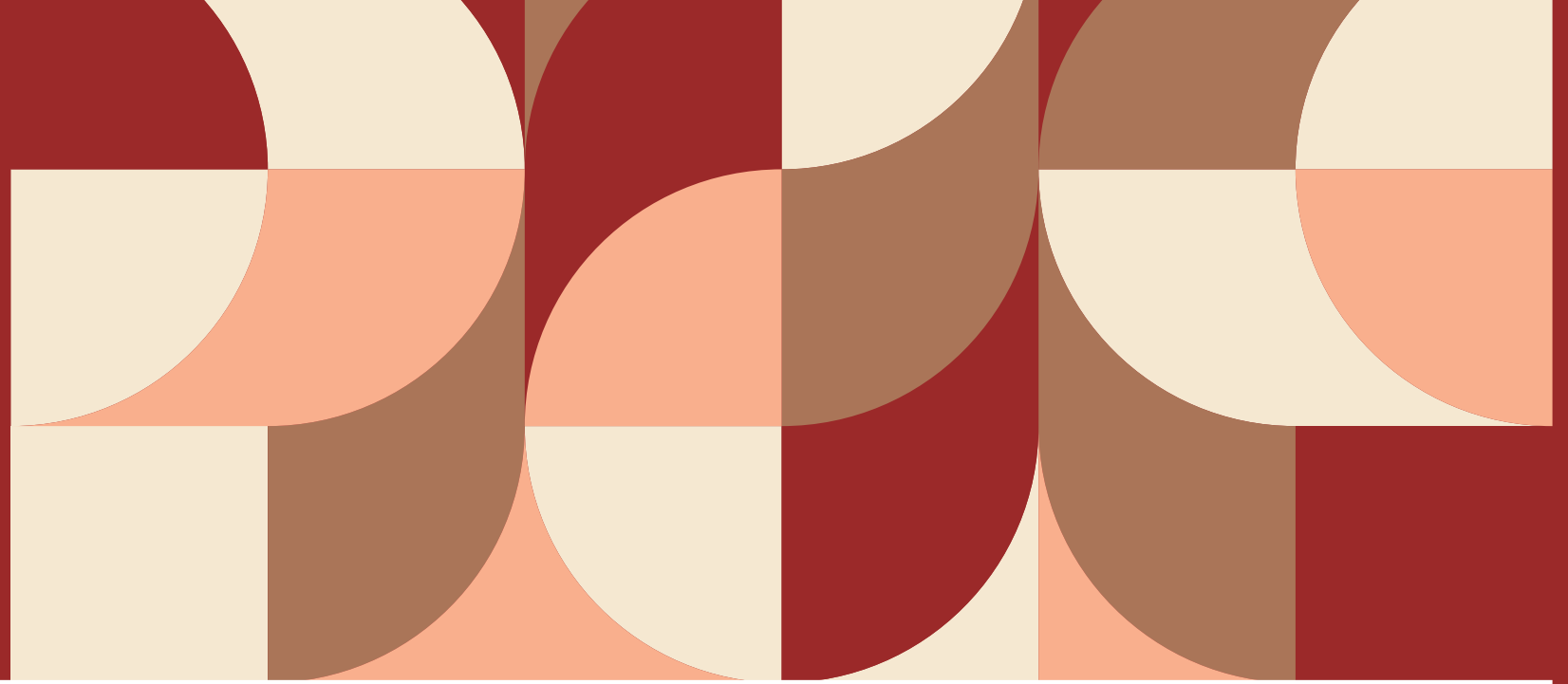
Through customer surveys, the How Much part inspects the longevity and long-term usability of the product anticipated in the Valuation stage as well as other consumer issues.

The survey asks about how long the customers have used the product,

their usage patterns, changes in consumer behaviors, and improvements to be made. The questions can vary for different products.

Example

In the case of Lumir K, the information to track include:
average lifespan of Lumir K, Lumir K usage patterns, causes of cooking oil lamp failure, whether users went back to kerosene lamps, and reasons for no longer using Lumir K



Impact IVM Guideline
User manual
APPENDIX

01	Risk prevention scores	62
02	World Bank country groups by income	65
03	Country Risk Premium	67
04	Calculation of RDR for post-exit valuation period	69
05	Calculation of post-exit value and final impact value	70

01 Risk prevention scores

1	
Risk factor	Reference study Quality
Explanation	<ul style="list-style-type: none"> Score the quality of the reference study as basis of impact value estimation. Studies published overseas : use the four groups of SJR (SCImago Journal Rank). Studies published in Korea: use registration status with National Research Foundation of Korea.
Point scale	25
Scores	<ul style="list-style-type: none"> Scores based on 4 groups of SJR <ul style="list-style-type: none"> 25: Q1 (within top 25%) 20: Q2 (within 25~50%) 15: Q3 (within 50~75%) 10: Q4 (below 75%) 8: Miscellaneous (presentations by government departments or international organizations, corporate experiment data, etc.) Scores based on National Research Foundation of Korea registration status <ul style="list-style-type: none"> 18: Registered with distinction 14: Registered 10: Registration candidate 8: Miscellaneous (presentations by government departments, corporate experiment data, etc)
2	
Risk factor	Product/project similarity
Explanation	<ul style="list-style-type: none"> Score the similarity between the product/project under Valuation and the product/project of the reference study. Score product similarity on a 15-point scale by using the goods and services classification code from KIPO. The code is headed by an alphabet G (goods) or S (service) and followed by a 4~6-digit number. Score project similarity on a 10-point scale by considering similarity in project and target users and projected usage. Sum the two scores to obtain product/project similarity score.
Point scale	25
Scores	<ul style="list-style-type: none"> Product similarity <ul style="list-style-type: none"> 15: The codes match in the alphabet and the first three digits. 10: The codes match in the alphabet and the first two digits. 5: The codes match in the alphabet and the first digit. Project similarity <ul style="list-style-type: none"> 10: Similar in three factors 7: Similar in only two factors 4: Similar in only one factor

3	
Risk factor	Similarity in social and economic contexts
Explanation	<ul style="list-style-type: none"> Score social context similarity by comparing the country of the product sales and the country of the reference study by urban population ratio. Score economic context similarity by comparing the countries by their income group.
Point scale	20
Scores	<ul style="list-style-type: none"> Scores based on urban population ratio <ul style="list-style-type: none"> 10: Difference in the urban population ratio is 10% or less 8: Difference in the urban population ratio is between 11% and 20% 6: Difference in the urban population ratio is between 21% and 30% 2: Difference in the urban population ratio is between 31% and 40% 0: Difference in the urban population ratio is 41% or more Scores based on country grouping by income <ul style="list-style-type: none"> 10: In the same group 7: 1-level difference in grouping 4: 2-level difference in grouping 1: 3-level difference in grouping
4	
Risk factor	Possibility of external variables
Explanation	<ul style="list-style-type: none"> Score the uncertainties that can trigger changes in society, system, laws, or regulations by using Country Risk Premium, available from NYU Professor of Finance Aswath Damodaran.
Point scale	20
Scores	<ul style="list-style-type: none"> Score based on Country Risk Premium <ul style="list-style-type: none"> 20: Country Risk Premium - $0 < 0.35\%$ (top 25%) 15: Country Risk Premium - $0.35\% < 0.77\%$ 10: Country Risk Premium - $0.77\% < 1.5\%$ (bottom 25%) 5: Country Risk Premium - $> 1.5\%$

	5
Risk factor	Interruption possibility
Explanation	<ul style="list-style-type: none"> Score the possibility of impact interruption by comparing the duration of the product's impact with the average of its competition. If the average of its competition is unavailable, produce a score by making a judgment on the prospect of the product and the characteristics of its impact.
Point scale	10
Scores	<ul style="list-style-type: none"> Score based on the comparison with the average of competition 10: The product's average lifespan is longer than competition by 90% or more 9: longer than competition by 70~89% 8: longer than competition by 50~69% 7: longer than competition by 30~49% 6: longer than competition by 10~29% 5: Same as competition or shorter by 1~9% 4: Shorter than competition by 0~29% 3: Shorter than competition by 30~49% 2: Shorter than competition by 50~69% 1: Shorter than competition by 70%

02 World Bank country groups by income¹⁾

Low Income Economy			
Afghanistan	Gambia, The	Mozambique	Tajikistan
Burkina Faso	Guinea	Niger	Togo
Burundi	Guinea-Bissau	Rwanda	Uganda
Central African Republic	Haiti	Sierra Leone	Yemen, Rep.
Chad	Korea, Dem. People's Rep.	Somalia	
Congo, Dem. Rep.	Liberia	South Sudan	
Eritrea	Malawi	Sudan	
Ethiopia	Mali	Syrian Arab Rep.	

Lower-middle Income Economy			
Angola	El Salvador	Morocco	Ukraine
Algeria	Eswatini	Myanmar	Uzbekistan
Bangladesh	Ghana	Nepal	Vanuatu
Benin	Honduras	Nicaragua	Vietnam
Bhutan	India	Nigeria	West Bank and Gaza
Bolivia	Kenya	Pakistan	Zambia
Cabo Verde	Kiribati	Papua New Guinea	Zimbabwe
Cambodia	Kyrgyz Rep.	Philippines	Tunisia
Cameroon	Lao PDR	São Tomé and Príncipe, Dem. Rep.	
Comoros	Lesotho	Senegal	
Congo, Rep.	Mauritania	Solomon Islands	
Côte d'Ivoire	Micronesia, Fed. Sts.	Sri Lanka	
Djibouti	Moldova	Tanzania	
Egypt, Arab Rep.	Mongolia	Timor-Leste	

1) <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>

Upper-middle Income Economy			
Albania	Dominica	Kazakhstan	Serbia
American Samoa	Dominican Rep.	Kosovo	South Africa
Argentina	Equatorial Guinea	Lebanon	St. Lucia
Armenia	Ecuador	Libya	St. Vincent and the Grenadines
Azerbaijan	Fiji	Malaysia	Suriname
Belarus	Gabon	Maldives	Thailand
Belize	Georgia	Marshall Islands	Tonga
Bosnia and Herzegovina	Grenada	Mexico	Turkey
Botswana	Guatemala	Montenegro	Turkmenistan
Brazil	Guyana	Namibia	Tuvalu
Bulgaria	Indonesia	North Macedonia	Venezuela, RB
China	Iran, Islamic Rep.	Paraguay	
Colombia	Iraq	Peru	
Costa Rica	Jamaica	Russian Federation	
Cuba	Jordan	Samoa	

High Income Economy			
Andorra	Estonia	Liechtenstein	San Marino
Antigua and Barbuda	Faroe Islands	Lithuania	Saudi Arabia
Aruba	Finland	Luxembourg	Seychelles
Australia	France	Macao SAR, China	Singapore
Austria	French Polynesia	Malta	Sint Maarten (Dutch Part)
Bahamas, The	Germany	Mauritius	Slovak Rep.
Bahrain	Gibraltar	Monaco	Slovenia
Barbados	Greece	Nauru	Spain
Belgium	Greenland	Netherlands	St. Kitts and Nevis
Bermuda	Guam	New Caledonia	St. Martin (French Part)
British Virgin Islands	Hong Kong SAR, China	New Zealand	Sweden
Brunei Darussalam	Hungary	Northern Mariana Islands	Switzerland
Canada	Iceland	Norway	Taiwan, China
Cayman Islands	Ireland	Oman	Trinidad and Tobago
Channel Islands	Isle of Man	Palau	Turks and Caicos Islands
Chile	Israel	Panama	United Arab Emirates
Croatia	Italy	Poland	United Kingdom
Curaçao	Japan	Portugal	United States
Cyprus	Korea, Rep.	Puerto Rico	Uruguay
Czech Rep.	Kuwait	Qatar	Virgin Islands (U.S.)
Denmark	Latvia	Romania	

03 Country Risk Premium²⁾

Country	Country Risk Premium	Country	Country Risk Premium	Country	Country Risk Premium
Abu Dhabi	0.48%	Cape Verde	5.33%	Ghana	6.30%
Albania	4.36%	Cayman Islands	0.59%	Greece	3.49%
Andorra (Principality of)	7.26%	Chile	0.68%	Guatemala	2.42%
Angola	7.26%	China	0.68%	Guernsey (States of)	0.00%
Argentina	11.62%	Colombia	1.84%	Honduras	4.36%
Armenia	3.49%	Congo (Democratic Republic of)	7.26%	Hong Kong	0.59%
Aruba	1.55%	Congo (Republic of)	8.72%	Hungary	2.13%
Australia	0.00%	Cook Islands	4.36%	Iceland	0.82%
Austria	0.38%	Costa Rica	5.33%	India	2.13%
Azerbaijan	2.91%	Côte d'Ivoire	3.49%	Indonesia	1.84%
Bahamas	2.91%	Croatia	2.42%	Iraq	7.26%
Bahrain	5.33%	Cuba	8.72%	Ireland	0.82%
Bangladesh	3.49%	Curacao	1.16%	Isle of Man	0.59%
Barbados	7.26%	Cyprus	2.91%	Israel	0.68%
Belarus	6.30%	Czech Republic	0.59%	Italy	2.13%
Belgium	0.59%	Denmark	0.00%	Jamaica	5.33%
Belize	9.68%	Dominican Republic	3.49%	Japan	0.68%
Benin	5.33%	Ecuador	9.68%	Jersey (States of)	0.00%
Bermuda	0.82%	Egypt	5.33%	Jordan	4.36%
Bolivia	5.33%	El Salvador	6.30%	Kazakhstan	2.13%
Bosnia and Herzegovina	6.30%	Estonia	0.68%	Kenya	5.33%
Botswana	0.82%	Ethiopia	5.33%	Korea	0.48%
Brazil	2.91%	Fiji	3.49%	Kuwait	0.68%
Bulgaria	1.55%	Finland	0.38%	Kyrgyzstan	5.33%
Burkina Faso	5.33%	France	0.48%	Laos	8.72%
Cambodia	5.33%	Gabon	7.26%	Latvia	1.16%
Cameroon	5.33%	Georgia	2.91%	Lebanon	19.18%
Canada	0.00%	Germany	0.00%	Liechtenstein	0.00%

2) http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html / website of Aswath Damodaran (NYU professor of finance)

Country	Country Risk Premium	Country	Country Risk Premium	Country	Country Risk Premium
Lithuania	1.16%	Peru	1.16%	Tanzania	5.33%
Luxembourg	0.00%	Philippines	1.84%	Thailand	1.55%
Macao	0.59%	Poland	0.82%	Togo	6.30%
Macedonia	3.49%	Portugal	2.13%	Trinidad and Tobago	2.42%
Malaysia	1.16%	Qatar	0.59%	Tunisia	5.33%
Maldives	6.30%	Ras Al Khaimah (Emirate of)	0.00%	Turkey	5.33%
Mali	7.26%	Romania	2.13%	Turks and Caicos Islands	1.55%
Malta	0.82%	Russia	2.13%	Uganda	5.33%
Mauritius	1.55%	Rwanda	5.33%	Ukraine	6.30%
Mexico	1.55%	Saudi Arabia	0.68%	United Arab Emirates	0.48%
Moldova	6.30%	Senegal	3.49%	United Kingdom	0.59%
Mongolia	6.30%	Serbia	3.49%	United States	0.00%
Montenegro	4.36%	Sharjah	1.84%	Uruguay	1.84%
Montserrat	2.13%	Singapore	0.00%	Uzbekistan	4.36%
Morocco	2.42%	Slovakia	0.82%	Venezuela	19.18%
Mozambique	8.72%	Slovenia	1.16%	Vietnam	3.49%
Namibia	3.49%	Solomon Islands	6.30%	Zambia	11.62%
Netherlands	0.00%	South Africa	2.91%		
New Zealand	0.00%	Spain	1.55%		
Nicaragua	6.30%	Sri Lanka	7.26%		
Niger	6.30%	St. Maarten	2.13%		
Nigeria	5.33%	St. Vincent & the Grenadines	6.30%		
Norway	0.00%	Suriname	9.68%		
Oman	3.49%	Swaziland	6.30%		
Pakistan	6.30%	Sweden	0.00%		
Panama	1.55%	Switzerland	0.00%		
Papua New Guinea	5.33%	Taiwan	0.59%		
Paraguay	2.42%	Tajikistan	6.30%		

04 Calculation of RDR for post-exit valuation period

4-1. Calculation of weighted average cost of capital

Formula: $A \times (1-E) \times C + B \times D = 0.76\%$	
Terms	
• A: Average borrowing rate (Rd)	3.00%
• B (=a+b+c): equity interest rate (Re)	9.11%
• a: 20-year Korean government bond interest rate (rf)	2.19%
• b: Korean market risk premium (Mkt Risk Prem)	5.20%
• c: beta equity	1.33%
• D: Equity ratio (we)	1.16%
• E: Tax rate (tax rate)	20%

4-2. RDR for post-exit valuation period

Impact	Investment period RDR	Weighted average cost of capital	Post-exit valuation period RDR
Reduction of economic burden due to respiratory disease by Lumir K	5.34%	0.76%	3.05%

05 Calculation of post-exit value and final impact value

5-1. Post-exit valuation period set at 5 years

A. Post-exit value

- a. Initial impact value for last year of investment period : USD 458,268,169 …… ①
- b. Post-exit valuation period growth rate: 2% …… ②
- c. Post-exit valuation period RDR : 3.05% …… ③

Unit: USD

post-exit value					
Year	1	2	3	4	5
Post-exit valuation period impact value (④)	467,433,533	476,782,203	486,317,847	496,044,204	505,965,088
Formula (①×(1+②) ⁿ)	458,268,169× [1+0.02] ¹	458,268,169× [1+0.02] ²	458,268,169× [1+0.02] ³	458,268,169× [1+0.02] ⁴	458,268,169× [1+0.02] ⁵
Post-exit	453,595,360	448,970,197	444,392,196	439,860,875	435,375,759
Formula (④)/(1+③) ⁿ)	467,433,533/ [1+0.0305] ¹	476,782,203/ [1+0.0305] ²	486,317,847/ [1+0.0305] ³	496,044,204/ [1+0.0305] ⁴	505,965,088/ [1+0.0305] ⁵
Total	2,222,194,387				

B. Final impact value

- a. RDR for investment period: 5.34% …… ①

Unit: USD

	2021	2022	2023	2024	2025	Post-exit
Year	1	2	3	4	5	5
Impact value (A)	8,467,379	86,367,266	176,189,223	305,512,113	458,268,169	2,222,194,387
Cash flow (B)	8,038,142	77,832,780	150,729,896	248,116,232	353,307,716	1,713,229,233
Formula (B=A/((1+C) ⁿ))	8,467,379/ [1+0.0534] ¹	86,367,266/ [1+0.0534] ²	176,189,223/ [1+0.0534] ³	305,512,113/ [1+0.0534] ⁴	458,268,169/ [1+0.0534] ⁵	2,222,194,387/ [1+0.0534] ⁵
Final impact value	2,551,254,000					

5-2. Post-exit valuation period set as permanent

A. Post-exit value:

Formula: Initial impact value for last year of investment period × (1+post-exit valuation period growth rate) / (post-exit valuation period RDR-post-exit valuation period growth rate)

- a. Post-exit value: **USD 44,484,653,856**
- b. Initial impact value for last year of investment period: USD 458,268,169
- c. Post-exit valuation period growth rate: 2%
- d. Post-exit valuation period RDR: 3.05%
- e. RDR for investment period: 5.34% …… ①

Unit: USD

	2021	2022	2023	2024	2025	Post-exit
Year	1	2	3	4	5	5
Impact value (A)	8,467,379	86,367,266	176,189,223	305,512,113	458,268,169	44,484,653,856
Cash flow (B)	8,038,142	77,832,780	150,729,896	248,116,232	353,307,716	34,296,013,818
Formula (B=A/((1+C) ⁿ))	8,467,379/ [1+0.0534] ¹	86,367,266/ [1+0.0534] ²	176,189,223/ [1+0.0534] ³	305,512,113/ [1+0.0534] ⁴	458,268,169/ [1+0.0534] ⁵	44,484,653,856/ [1+0.0534] ⁵
Final impact value	35,134,038,584					

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