Transformational Change Methodology

PART III: IMPACT ASSESSMENT

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Overview of ICAT

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Introductory Guide

Impact Assessment Methodologies

Greenhouse gas impacts

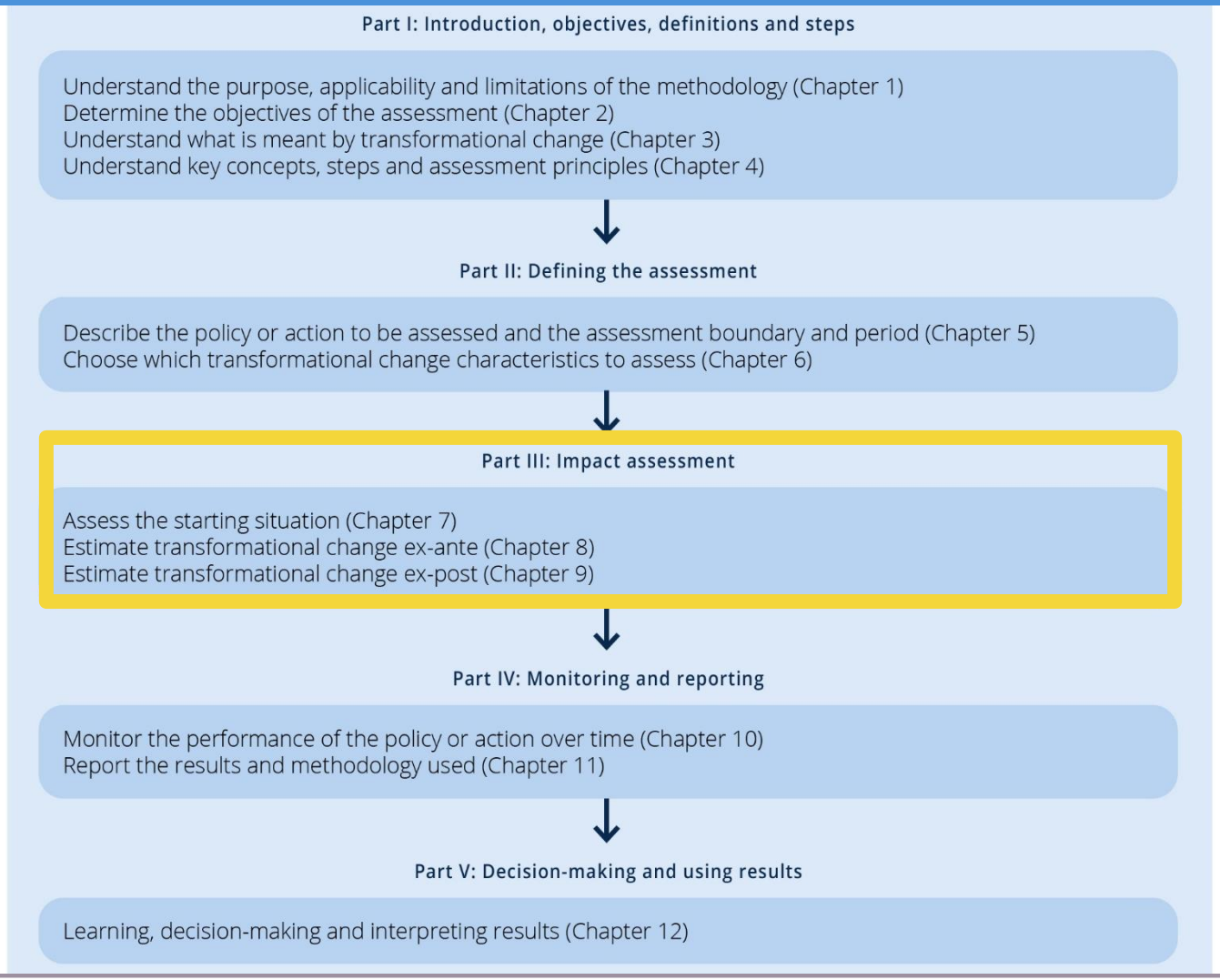
- Renewable Energy
- Buildings Efficiency
- Transport Pricing
- Agriculture
- Forestry

- Sustainable Development
- Transformational Change
- Non-State and Subnational Action

Process Guidance Documents

- Stakeholder Participation
- Technical Review

Overview of the methodology



Overview of the methodology

Part III: Impact assessment

- Assess the starting situation (Chapter 7)
- Estimate transformational impacts ex-ante (Chapter 8)
- Estimate transformational impacts ex-post (Chapter 9)

This indicates a key recommendation

Chapter 7 | Chapter 8 | Chapter 9

This is an interactive panel: navigate by clicking on a particular step

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Chapter 7. Assess the starting situation

Assess the state of the system at the beginning of the assessment period

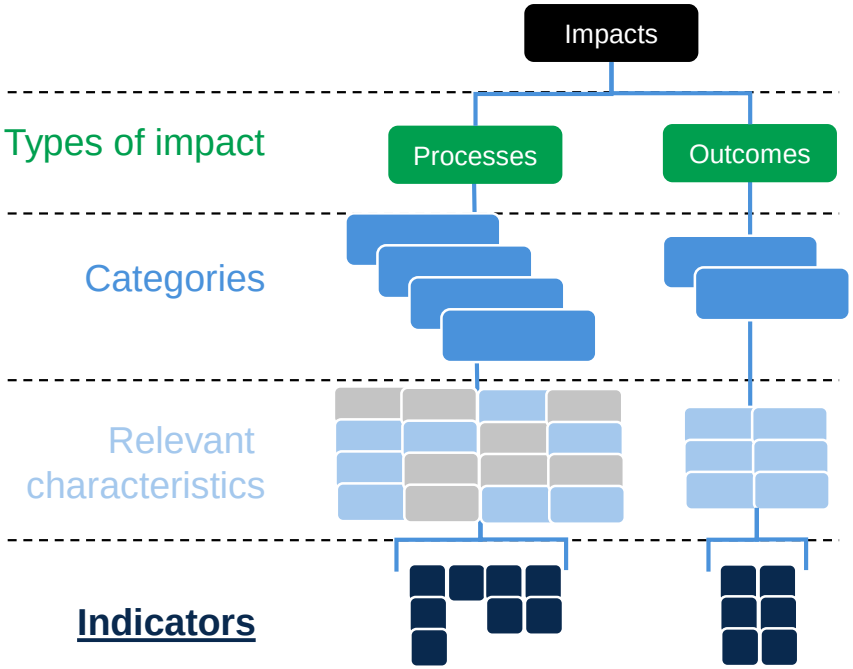
Identify indicators to describe the starting situation
(Section 7.1)

→

Provide values for indicators to describe the starting situation
(Section 7.1)

7. Identify indicators

1
IDENTIFY INDICATORS

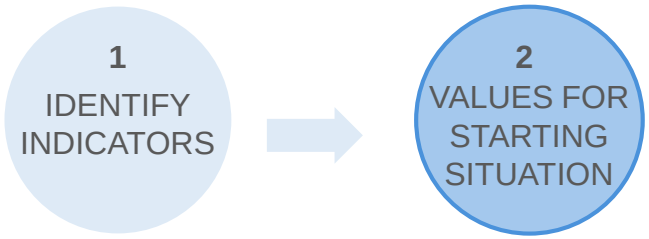


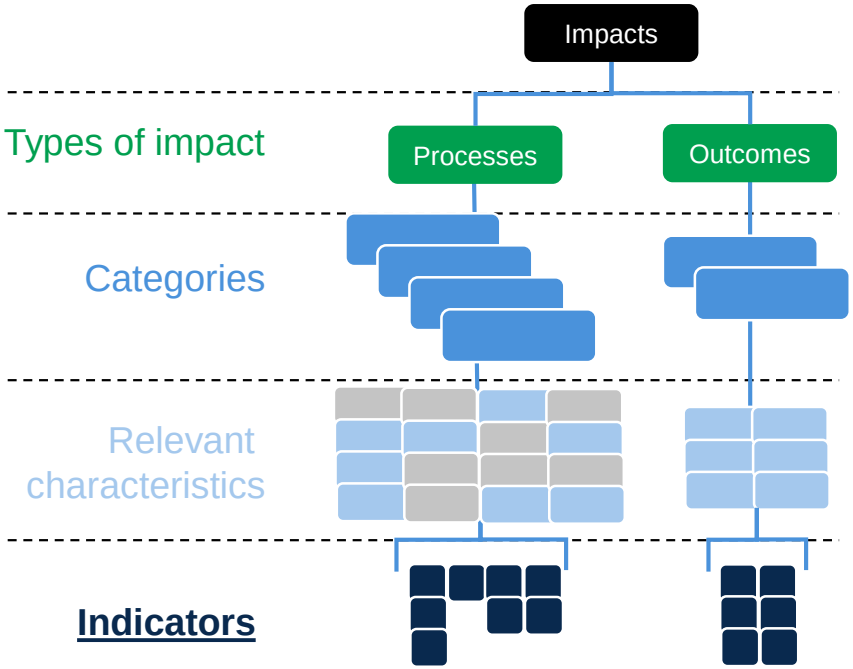
MEASURABLE
SPECIFIC
SUSTAINED NATURE
TIME-BOUND
ACHIEVABLE
SCALE
REALISTIC

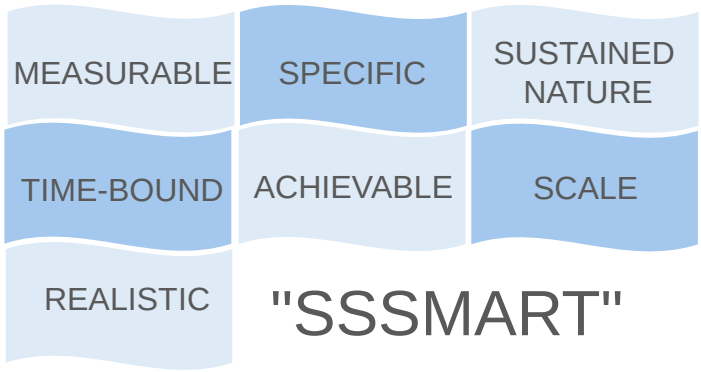
"SSSMART"

Identify indicators to describe the starting situation of characteristics impacted by the policy

7. Provide values for indicators

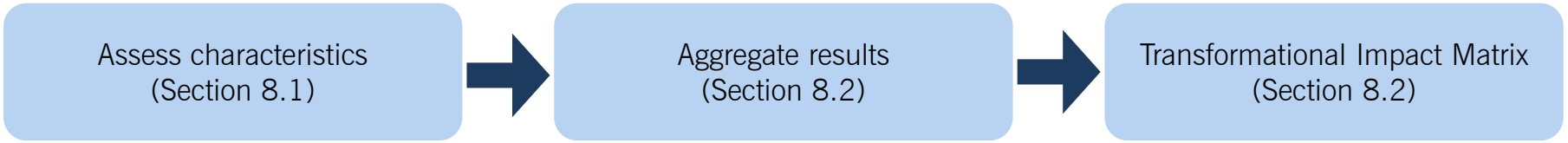






Chapter 8. Ex-ante assessment

Estimating transformational impacts ex-ante



8. Assess characteristics

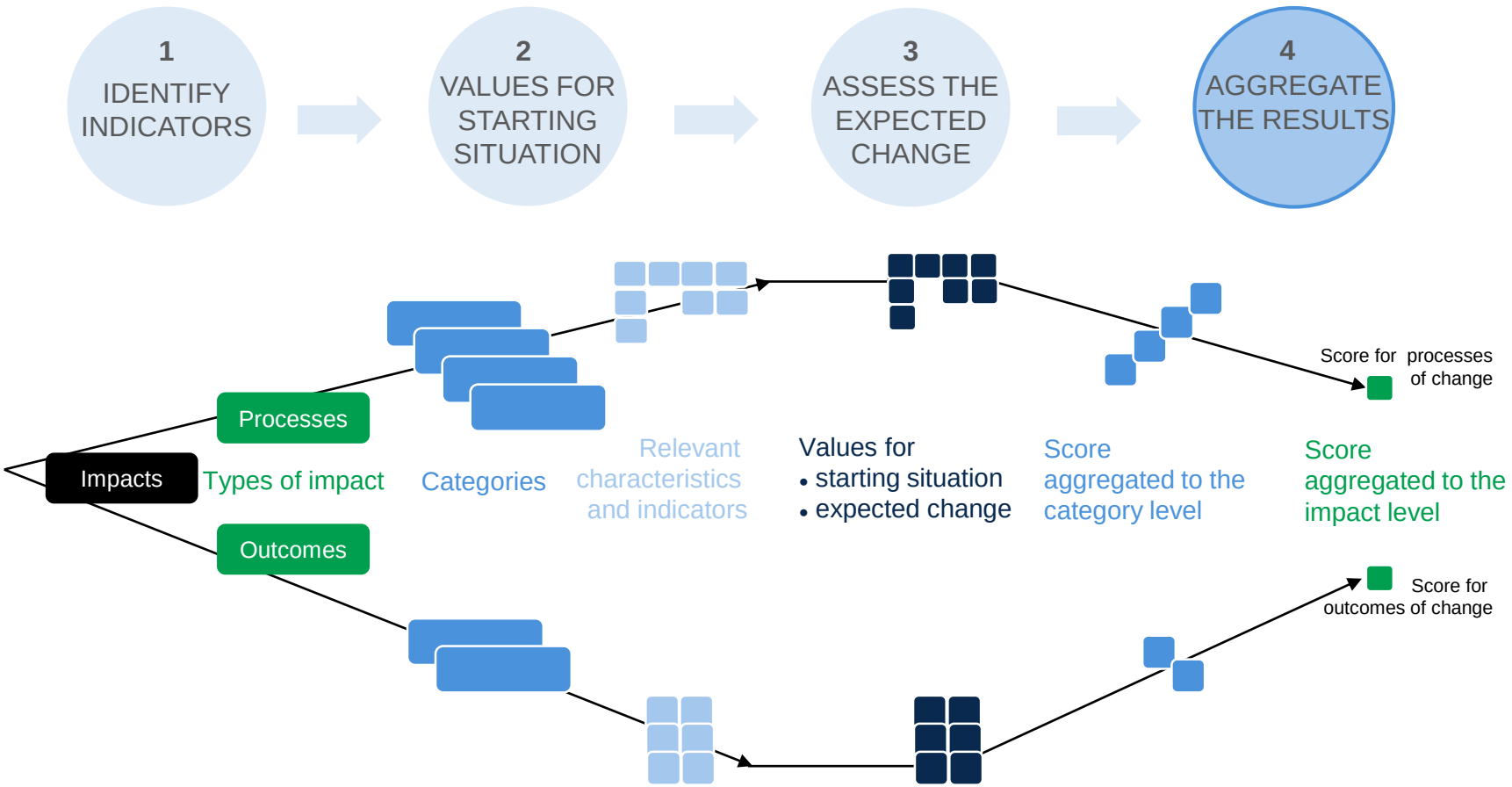
OUTCOME CHARACTERISTICS SCALE				
-1	0	1	2	3

OUTCOME CHARACTERISTICS SUSTAINED OVER TIME				
-1	0	1	2	3

PROCESS CHARACTERISTICS				
0	1	2	3	4

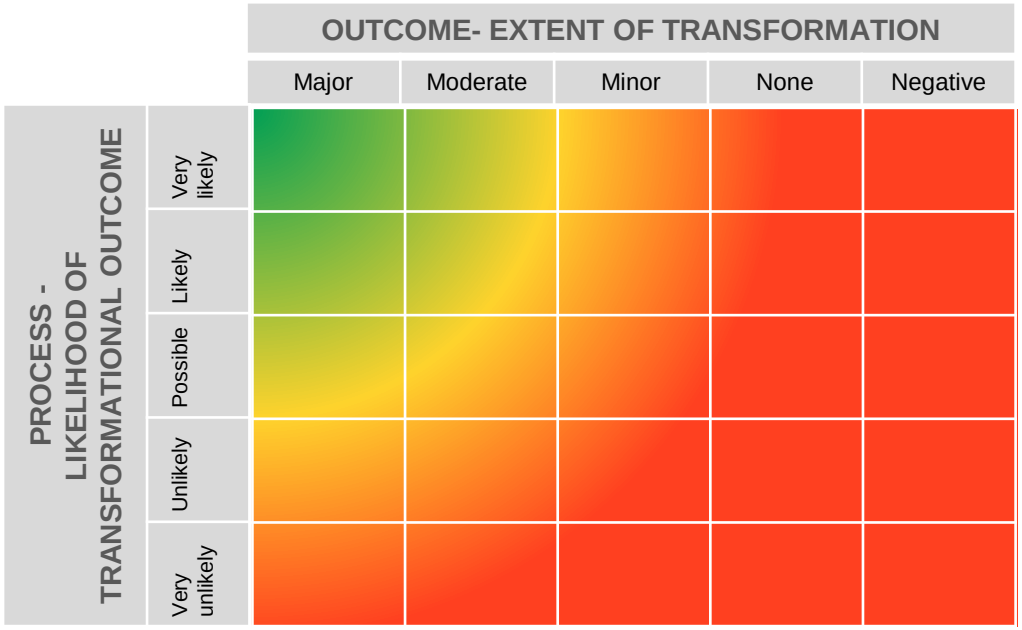
Qualitatively assess each characteristic and explain the underlying assessment

8. Aggregate results

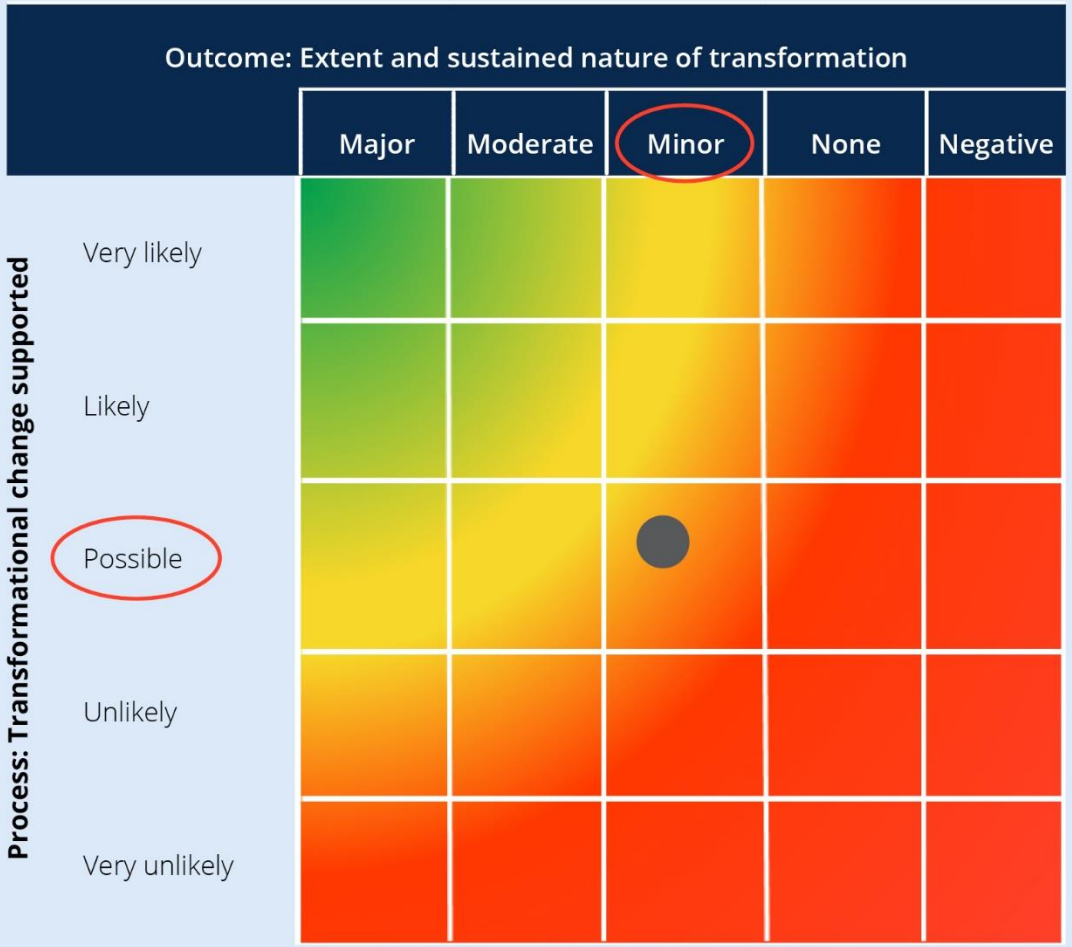


Aggregate the results for all characteristics and barriers to the process and outcome level

8. Transformational impact matrix

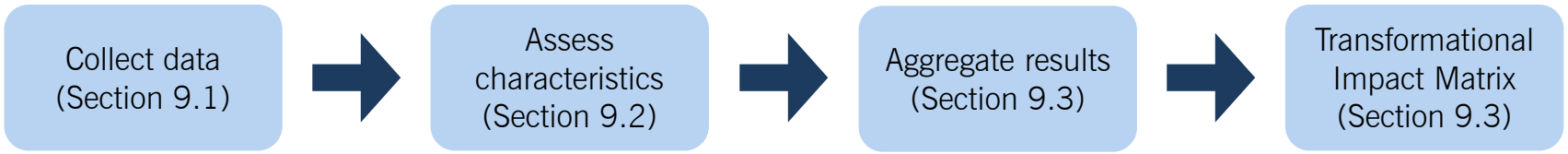


8. Transformational impact matrix



Chapter 9. Ex-post assessment

Estimating transformational impacts ex-ante

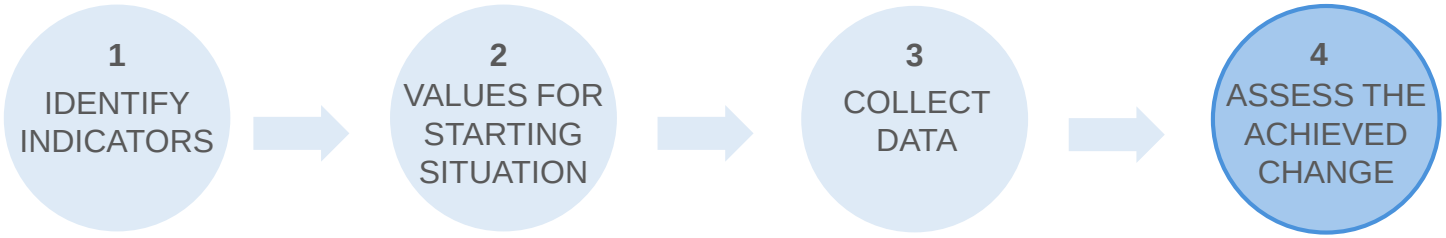


9. Data collection

The ex-post indicator value is based on observed data and shows the extent to which the policy or action has influenced the characteristic relative to the starting situation.

Collect data for selected indicators

9. Assess characteristics



A qualitative scale is used for scoring the transformational characteristics based on the indicator values.

OUTCOME CHARACTERISTICS SCALE				
-1	0	1	2	3

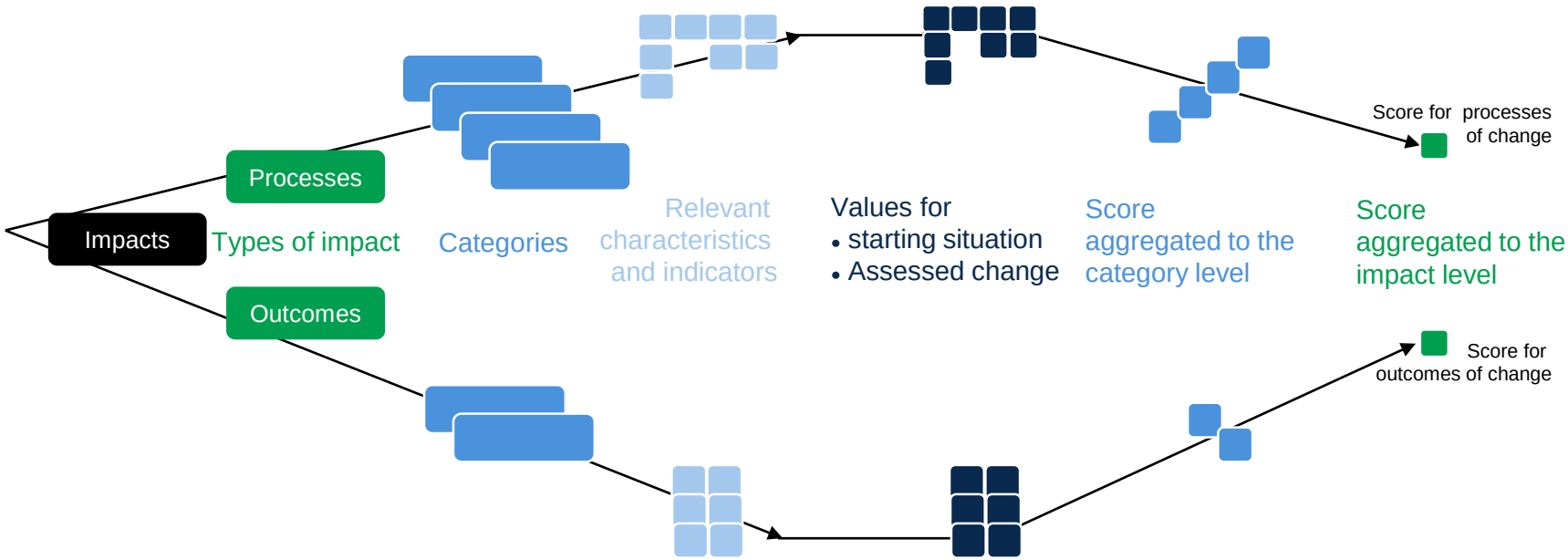
OUTCOME CHARACTERISTICS SUSTAINED OVER TIME				
-1	0	1	2	3

PROCESS CHARACTERISTICS				
0	1	2	3	4

Assess characteristics using indicators to assess the extent of transformation achieved by the policy or action

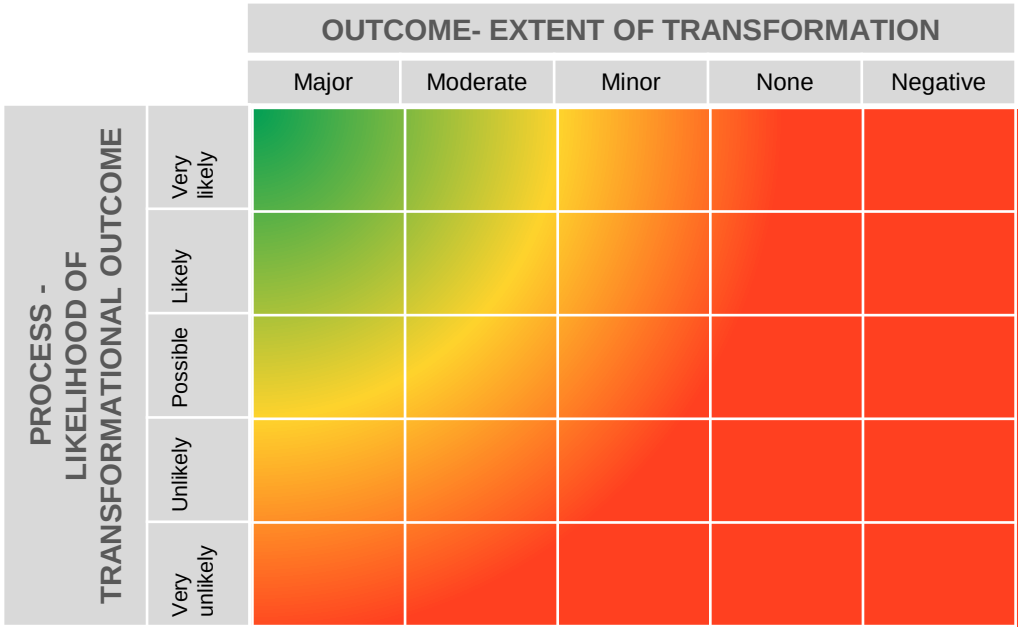
9. Aggregate results

1 IDENTIFY INDICATORS → 2 VALUES FOR STARTING SITUATION → 3 COLLECT DATA → 4 ASSESS THE ACHIEVED CHANGE → 5 AGGREGATE THE RESULTS



Aggregate the results for all characteristics to the process and outcome level and describe the overall assessment

9. Transformational impact matrix



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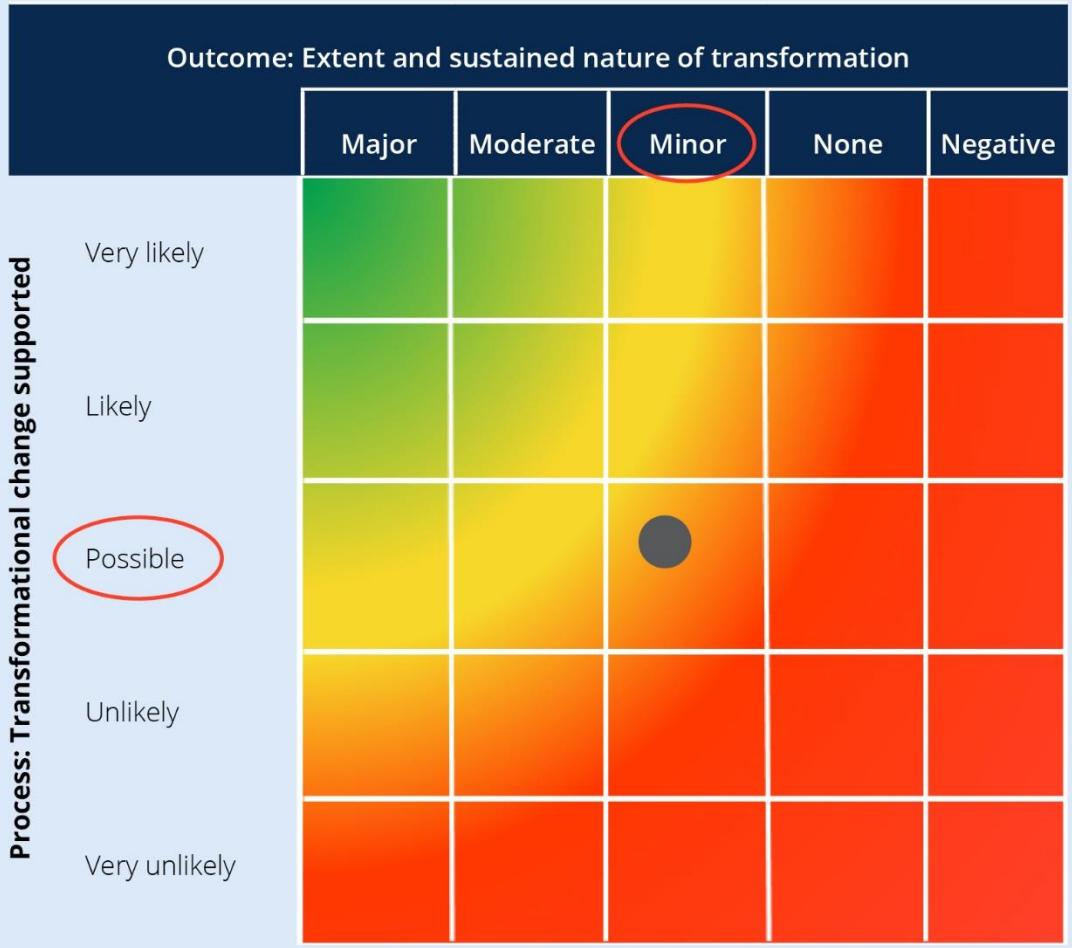

Pilot Case Studies using this Methodology

- Development of a Tonga Energy Efficiency Master Plan
- Assessment of the Transformational Change Potential for the Citizens of the Future Initiative in Bolivia
- Geothermal Energy Development Policy in Uganda
- Assessment of the Transformational Potential of the NACAG Initiative

Thank You

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7. Example of outcome indicators (non-exhaustive)

CATEGORY and CHARACTERISTICS		INDICATORS
Scale of outcome GHG and sustainable development	Macro level	• Share of total GHG emission reductions or removals globally, regionally, by sector or subsector • Achievement of global Sustainable Development Goals in percentage • Share of zero carbon emissions in electricity generation compared to global best practices • Average total emissions per KWh
	Medium level	• Achievement of national Sustainable Development Goals in percentage • Limits to growth of final energy use in the sector or subsector targeted to X% compared to the starting situation • Capacity share of zero carbon emissions • Subsector energy intensity
	Micro level	• Achievement of subnational or local sustainable development targets • New-build emissions intensity • Equipment energy performance • Per capita energy use and emissions intensity
Sustained over time GHG and sustainable development	Long term	• By 2100 phase out of all fossil fuels • By 2050 phase out of coal plants • Long-term RE goals • Sustainable development benefits by 2050 (disaggregated by sustainable development impacts)
	Medium term	• By 2030 achieve the global and national Sustainable Development Goals • By 2030 phase out of X% of coal plants • Accelerate energy efficiency by limiting growth of final energy use in the sector or subsector targeted to X% by 2030 compared to the starting situation • GHG impacts (tCO2e) over a medium-term period (e.g. 2019-2028)
	Short term	• By 2020 achieve X% of the Sustainable Development Goals • By 2020 phase out of X% of coal plants • Accelerate energy efficiency by limiting growth of final energy use in the sector or subsector to X% by 2020 compared to the starting situation • GHG impacts (tCO2e) in the short-term (e.g., 2015-2018)

7. Example of process indicators (non-exhaustive)

CATEGORY and CHARACTERISTICS		INDICATORS
Technology	Research and Development	• R&D investments/funding • Patents registered (applied)
	Adoption	• Number of new businesses/start-ups • Number of new business models
	Scale up	• Number of workshops, platforms for knowledge sharing among industry associations etc. • Number of new demonstration projects initiated
Agents	Entrepreneurs	• Number of new entrepreneurs and new entrants in the low carbon sectors • Provision of training in entrepreneurship
	Coalitions of advocates	• Trade expos, business shows, workshops, conferences, seminars • University-industry collaboration
	Beneficiaries	• Number of grassroot campaigns in favor of low carbon practices • Number of owners and holders of forest lands and grazing lands that implement regenerative practices
Incentives	Economic and non-economic incentives	• New subsidies, tariff structures such as renewable energy obligations, feed-in tariffs, renewable energy auctions • New MOUs signed
	Disincentives	• Disincentives provided via carbon pricing/tax, increase in petrol/diesel prices, car registration tax etc. • Number of counterproductive subsidies eliminated
	Institutional and regulatory	• Disincentives provided via carbon pricing/tax, increase in petrol/diesel prices, car registration tax etc. • Number of counterproductive subsidies eliminated
Norms	Awareness	• Number of open debates/statements/publications highlighting the insufficiency of current practices • Number of leaders/organizations pushing/heading debates questioning current practices and pathways and lobbying for behavioural change
	Behaviour	• New government persuasion programs, appealing to the collective conscious through the medium of advertising • New government enforcement programs and initiatives compelling behavior change
	Social norms	• New regulatory standards (e.g., mandatory emission levels) • New laws making previous behaviour illegal

7. Provide values for relevant process indicators: example

CATEGORY and CHARACTERISTICS		INDICATORS	Indicator value at starting situation (2016 – for solar PV example)
Technology	Adoption	Number of new demonstration projects for solar rooftop PV initiated	None
	Scale up	Share of installed PV rooftop in the solar sector (nationwide or statewide)	5%
Agents	Entrepreneurs	Volume of venture capital investments	USD 100 million
	Coalitions of advocates	Number of projects/research centers involving university-industry collaboration	1
Incentives	Economic and non-economic incentives	Number of new economic incentives in place for grid rooftop solar	1
	Disincentives	Number of new disincentives to discourage fossil fuels to generate electricity	1
	Institutional and regulatory	Number of new regulations and institutions set up to promote solar	3
Norms	Behaviour	Number of new measures to influence consumer behaviour in favour of solar/ renewable energy	None
	Social norms	Number of emerging leaders/role models (e.g., states leading the transition to renewable energy) favoring renewables	None

7. Provide values for relevant outcome indicators: example

CATEGORY and CHARACTERISTICS		INDICATORS	Indicator value (2016 –solar PV example)
Scale of outcome (GHGs)	Medium level National or sectoral level (medium level)	Installed capacity of grid-connected solar rooftop power plants (up to 500 KW) at a national level	1 GW
	Subnational level (micro level)	Installed capacity of grid-connected solar rooftop power plants (up to 500 KW) at a subnational level (state level average capacity)	100 MW
Scale of outcome (SD)	National or sectoral level (medium level)	Employment generation in solar sector at a national level	10,000
	Subnational level (micro level)	Employment generation in solar sector in province X	600
Outcome sustained over time (GHGs)	Medium term (≥5 years and <15 years from the starting situation)	Trend in installed capacity of grid-connected solar rooftop power plants (up to 500 KW)	NA
	Short term (0<5 years from the starting situation)	Trend in installed capacity of grid-connected solar rooftop power plants (up to 500 KW)	NA
Outcome sustained over time (SD)	Medium term (≥5 years and <15 years from the starting situation)	Trend in employment generation in solar sector	NA
	Short term (0<5 years from the starting situation)	Trend in employment generation in solar sector	NA

7. Provide values for relevant indicators: exercise

Process indicators

Category	Characteristics	Relevant/ Possibly relevant/ Not relevant	Indicators	Value at starting situation
Technology	Research and development			
	Adoption			
	Scale up			
Agents	Entrepreneurs			
	Coalitions of advocates			
	Beneficiaries			
Incentives	Economic and non-economic incentives			
	Disincentives			
	Institutional and regulatory			
Norms	Awareness			
	Behaviour			
	Social norms			

Outcome indicators

Category	Characteristics	Inside / Outside the scope	Indicators	Value at starting situation
Scale of outcome GHGs	Macro level			
	Medium level			
	Micro level			
Scale of outcome Sustainable development	Macro level			
	Medium level			
	Micro level			
Outcome sustained over time GHGs	Long term			
	Medium term			
	Short term			
Outcome sustained over time Sustainable development	Long term			
	Medium term			
	Short term			

8 & 9. Scale for scoring: processes

SCALE		DESCRIPTION OF SCALE
Process characteristics	4	It **is very likely** that the policy or action will have a significant positive impact on this characteristic over the assessment period (for example, a probability in the range of 90-100%)
	3	It is **likely** that the policy or action will have a significant positive impact on this characteristic over the assessment period (for example, a probability in the range of 66-90%)
	2	It is **possible** that the policy or action will have a significant positive impact on this characteristic over the assessment period (for example, a probability in the range of 33-66%). Instances where the likelihood is unknown or cannot be determined should be considered possible.
	1	It is **unlikely** that the policy or action will have a significant positive impact on this characteristic over the assessment period (for example, a probability in the range of 10-33%)
	0	It is **very unlikely** that the policy or action will have a significant positive impact on this characteristic over the assessment period (for example, a probability in the range of 0-10%)

8 & 9. Scale for scoring: outcomes

SCALE		DESCRIPTION OF SCALE
Outcome characteristics Scale	3	The policy or action results in GHG impacts (or sustainable development impacts) that relative to the starting situation represent **large** emission reductions (or net positive **large** impacts) at the level of assessment targeted.
	2	The policy or action results in GHG impacts (or sustainable development impacts) that relative to the starting situation represent **moderate** emissions reductions (or net positive **moderate** impacts) at the level of assessment targeted
	1	The policy or action results in GHG impacts (or sustainable development impacts) that relative to the starting situation represent **minor** emission reductions (or net positive **minor i**mpacts) at the level of assessment targeted
	0	The policy or action **does not result** in GHG impacts (or sustainable development impacts) relative to the starting situation at the level of assessment targeted
	-1	The policy or action results in GHG impacts (or sustainable development impacts) that relative to the starting situation represent a net **increase** in emissions (or **net negative** impacts) at the level of assessment targeted
Outcome characteristics Sustained over time	4	The policy or action results in GHG impacts (or sustainable development impacts) that are **very likely** to be sustained over the assessment period (for example, a probability in the range of 90-100%)
	3	The policy or action results in GHG impacts (or sustainable development impacts) that **are likely** to be sustained within the assessment period (for example, a probability in the range of 66-90%)
	2	The policy or action results in GHG impacts (or sustainable development impacts) that are **possibly** sustained within the assessment period (for example, a probability in the range of 33-66%). Instances where the likelihood is unknown or cannot be determined should be considered possible.
	1	The policy or action results in GHG impacts (or sustainable development impacts) that **are less likely** to be sustained over the assessment period (for example, a probability in the range of 10-33%)
	0	The policy or action results in GHG impacts (or sustainable development impacts) that are **unlikel**y to be sustained over the assessment period and risk being reversed to negative impacts (for example, a probability in the range of 0-10%)

8 & 9. Assess outcome characteristics: example of solar PV policy

CATEGORY and CHARACTERISTICS		SCORE	RATIONALE JUSTIFYING THE SCORE	INDICATORS	Indicator value	
					2016	**2030**
Scale of outcome (GHGs)	Medium level National or sectoral level	3	The policy aimed at national level impacts is likely to achieve its vision related to GHGs. The 2022 target and mid-term vision is ambitious.	Installed capacity of grid-connected solar rooftop power plants (up to 500 KW) at a national level	1 GW	50 GW
	Micro level Subnational level	3	The policy is likely to achieve its national level targets through developing solar power in states and cities.	Installed capacity of grid-connected solar rooftop power plants (up to 500 KW) at a subnational level (state level average capacity)	100 MW	1 GW
Scale of outcome (SD)	Medium level National or sectoral level	3	Growth is solar is expected to be accompanied by a large boost to employment in this sector.	Employment generation in solar sector at a national level	10,000	1 mn
	Micro level Subnational level	2	While in some regions there is expected to be a net large positive impact on job creation, in many others the impact is likely to be moderate.	Employment generation in solar sector in province X	600	40,000
Outcome sustained over time (GHGs)	Medium term (≥5 years and <15 years from the starting situation)	2	In the medium term, no reversal of impacts is expected and the gains made by the solar PV policy are likely to be sustained over the assessment period.	Trend in installed capacity of grid-connected solar rooftop power plants (up to 500 KW)	NA	Sustained growth expected from 2022 - 2030
	Short term (0<5 years from the starting situation)	3	In the short-term too, no reversal of impacts is expected and the gains achieved are likely to be sustained through this period and beyond.	Trend in installed capacity of grid-connected solar rooftop power plants (up to 500 KW)	NA	Sustained growth through 2022
Outcome sustained over time (SD)	Medium term (≥5 years and <15 years from the starting situation)	2	Employment generation is likely to be sustained with increase in solar rooftop projects.	Trend in employment generation in solar sector	NA	Sustained growth expected from 2022 - 2030
	Short term (0<5 years from the starting situation)	3	Employment generation is highly likely to be sustained over the short-term with increase in solar rooftop projects	Trend in employment generation in solar sector	NA	Sustained growth through 2022

Previous slide: EX-ANTE

Previous slide: EX-POST

8 & 9. Assess process characteristics: example of solar PV policy

CATEGORY and CHARACTERISTICS		SCORE	RATIONALE JUSTIFYING THE SCORE	INDICATORS	Indicator value	
					2016	**2030**
Technology	Adoption	3	The financial subsidy and feed-in tariff have been widely used to increase adoption of clean technology across the world, and a similar result can be realistically expected in this case too.	Number of new demonstration projects for solar rooftop PV initiated	None	10
	Scale up	3	Financial subsidy and feed-in tariff have been widely used to scale up clean technology across the world. Together, these will address the barrier of high upfront financial investment needed for solar PV and improve the payback period on solar.	Share of installed PV rooftop in the solar sector (nationwide or statewide)	5%	30%
Agents	Entrepreneurs	3	The policy is likely to influence entrepreneurs and investors to invest in solar-related businesses and capitalize on the financial incentives available.	Volume of venture capital investments	USD 100 million	USD 1 billion
	Coalitions of advocates	2	Solar PV policy is likely to indirectly support the creation of coalitions and networks.	Number of projects/research centers involving university-industry collaboration	1	10
Incentives	Economic and non-economic incentives	3	In the medium term, no reversal of impacts is expected and the gains made by the solar PV policy are likely to be sustained over the assessment period.	Number of new economic incentives in place for grid rooftop solar	1	5
	Disincentives	0	In the short-term too, no reversal of impacts is expected and the gains achieved are likely to be sustained through this period and beyond.	Number of new disincentives to discourage fossil fuels to generate electricity	1	1
	Institutional and regulatory	2		Number of new regulations and institutions set up to promote solar	3	10
Norms	Behaviour	2	Employment generation is likely to be sustained with increase in solar rooftop projects.	Number of new measures to influence consumer behaviour in favour of solar/ renewable energy	None	1
	Social norms	1	Employment generation is highly likely to be sustained over the short-term with increase in solar rooftop projects	Number of emerging leaders/role models (e.g., states leading the transition to renewable energy) favoring renewables	None	1-2

Previous slide: EX-ANTE
Previous slide: EX-POST

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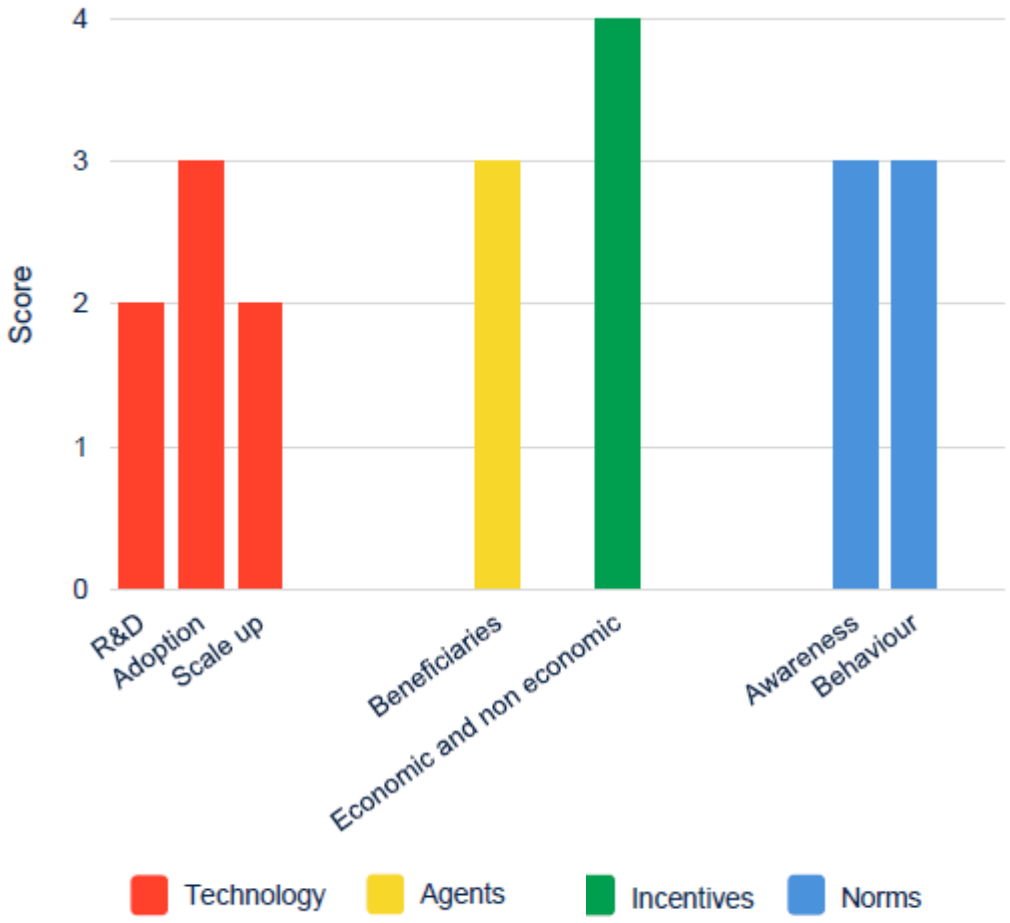
8. Tonga Energy Efficiency Master Plan case study: processes

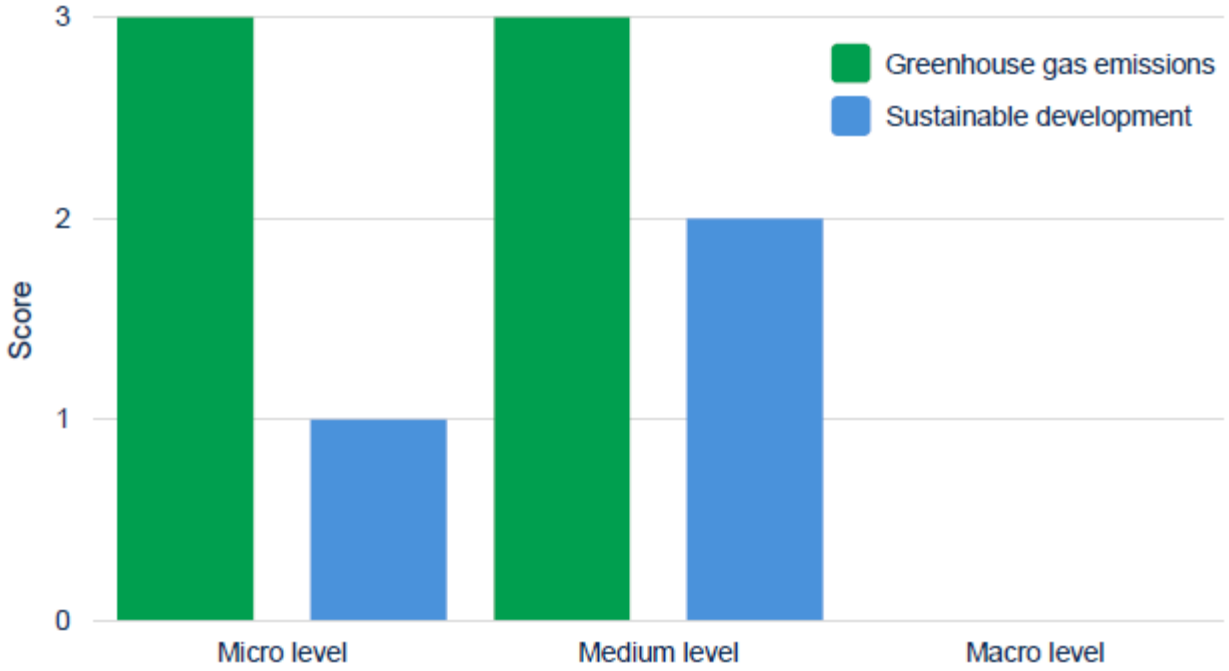
Likelihood that the assessed Tonga Energy Efficiency Masterplan policies and actions may impact the transformational change characteristics over the assessment period.



Previous slide: EX-ANTE
Previous slide: EX-POST
Case study: scale of outcomes
Case study: sustained outcomes
Case study: transformational impact matrix

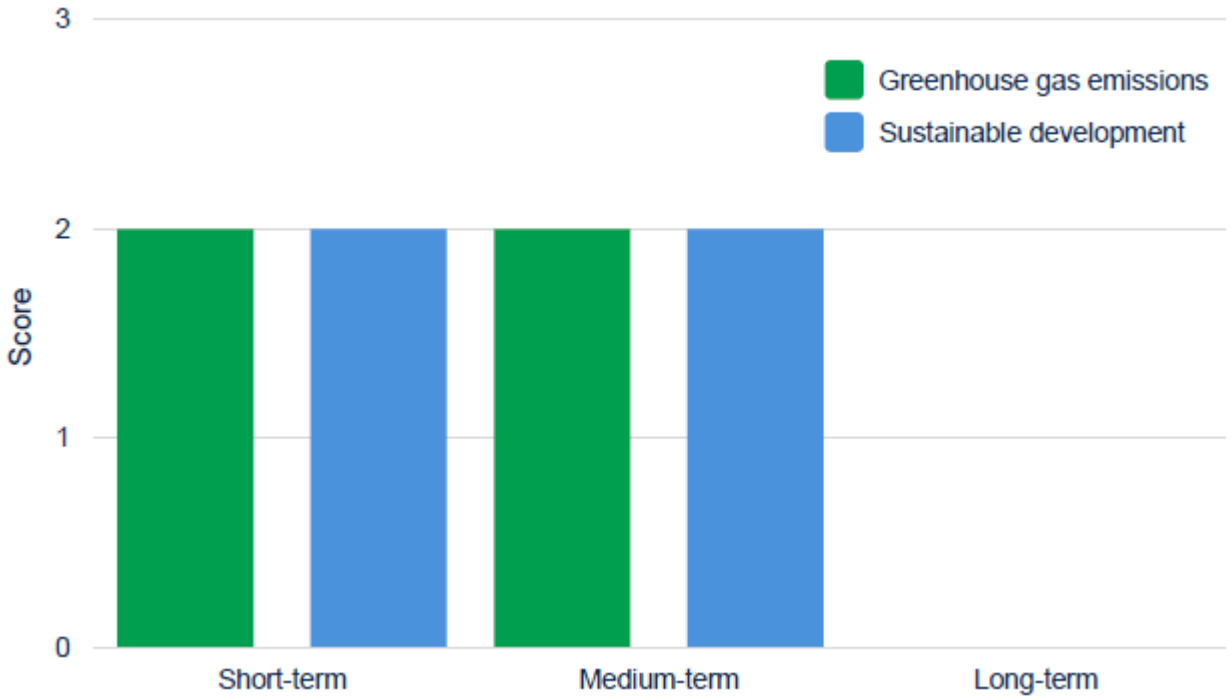
8. Tonga Energy Efficiency Master Plan case study: scale of outcomes

Extent policies or actions may result in GHG impacts that relative to the starting situation represent large emission reductions at the levels of assessment targeted.



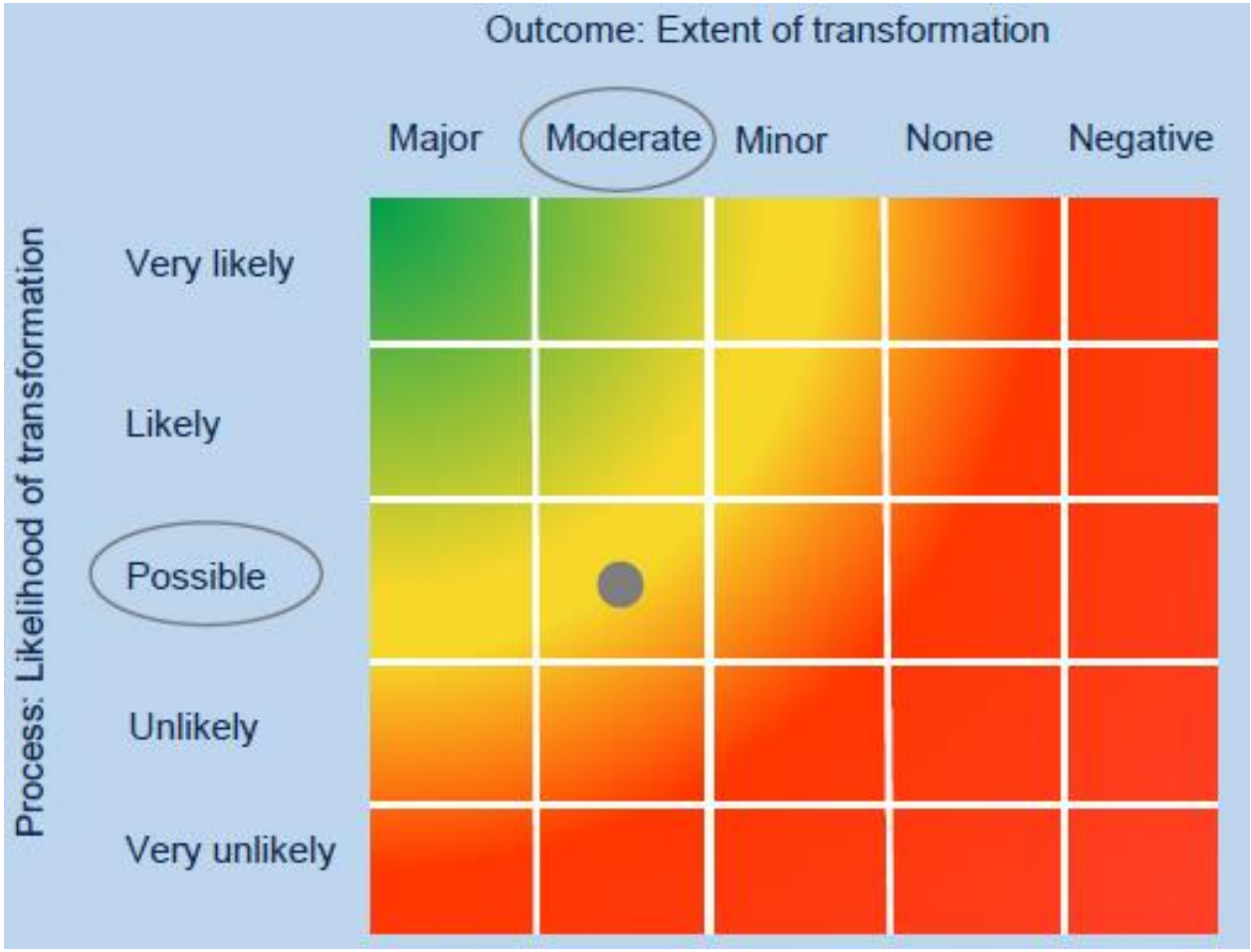
8. Tonga Energy Efficiency Master Plan case study: sustained outcomes

Extent policies and actions may result in GHG or sustainable development impacts that are likely to be sustained over the assessment period.



8. Tonga Energy Efficiency Master Plan case study: transformation matrix

The extent of transformation expected to be achieved by the Tonga Energy Efficiency Masterplan is moderate and the outcome is possibly sustained over time.



8. Tonga Energy Efficiency Master Plan case study: transformation matrix

The extent of transformation expected to be achieved by the Tonga Energy Efficiency Masterplan is moderate and the outcome is possibly sustained over time.