TECHNOLOGY WS6
FACILITATION MECHANISM

SUSTAINABLE DEVELOPMENT GOALS

Session 3

Challenge-led approach to STI roadmaps: methodology and lessons learnt from JRC's experience

On-line training session on STI policy and policy instruments for SDGs for Asia and the Pacific

November 18-21

UN-IATT Workstream 6 on
Capacity-Building in STI for SDGs

Angela Sarcina
European Commission – Joint Research Centre
angela.sarcina@ec.europa.eu.com

European Commission

Policy roadmaps as systemic instruments for STI policy

Definition	Key Functions	Benefits	Challenges	Potential
• Policy roadmaps are **strategic frameworks** that orchestrate a gradual shift of policy mix towards challenge-oriented approaches, providing **directionality and coherence for sustainability goals**.	• Develop **long-term vision** and desired futures • Explore **alternative** innovation and technology pathways • Align **stakeholders** • Support policy design, planning, and implementation	• Integrate various methods and tools for foresight, strategic planning, management, and evaluation • Provide a **systemic approach** that bridges policy fields and supports challenge-oriented policies • Foster **collective deliberation** of visions and pathways among stakeholders	• Embracing urgency, complexity, and uncertainty in sustainability transitions • Addressing systemic shortcomings and failings of policy processes	• Versatile systemic instrument for strengthening directionality and coherence of STI policy

Source: JRC, forthcoming

Cooperation with UN Inter-Agency Task Team on STI for SDGs

TECHNOLOGY FACILITATION MECHANISM — SUSTAINABLE DEVELOPMENT GOALS

UNITED NATIONS INTERAGENCY TASK TEAM ON STI FOR THE SDGS (IATT)

10-MEMBER GROUP TO SUPPORT THE TECHNOLOGY FACILITATION MECHANISM

MULTI-STAKEHOLDER FORUM ON SCIENCE, TECHNOLOGY AND INNOVATION FOR THE SDGS (STI FORUM)

ONLINE PLATFORM (2030 Connect) - GATEWAY FOR INFORMATION ON EXISTING STI INITIATIVES, MECHANISMS AND PROGRAMS

European Commission | SUSTAINABLE DEVELOPMENT GOALS

The Joint Research Centre (JRC) supports the Sustainable Development Goals

2018

Cooperation with UN IATT:

- UNDESA
- UNCTAD
- UNESCO
- UNIDO
- The World Bank

2019

Global Pilot Programme:

- Ethiopia
- Ghana
- India
- Kenya
- Serbia

2020

Capacity building: 1200+ policy makers worldwide

2021

Guidebook on STI for SDGs Roadmaps

2021

Partnership in Action (PiA) is proposed

2021

Serbia and Ghana complete the Roadmaps

Ukraine joins the Global Pilot Programme

2022

Kenya, Ethiopia, India complete the Roadmaps

UN General Assembly Resolutions
75/316
76/213

2022

Launch of STI for SDGs roadmaps in Africa project

2023

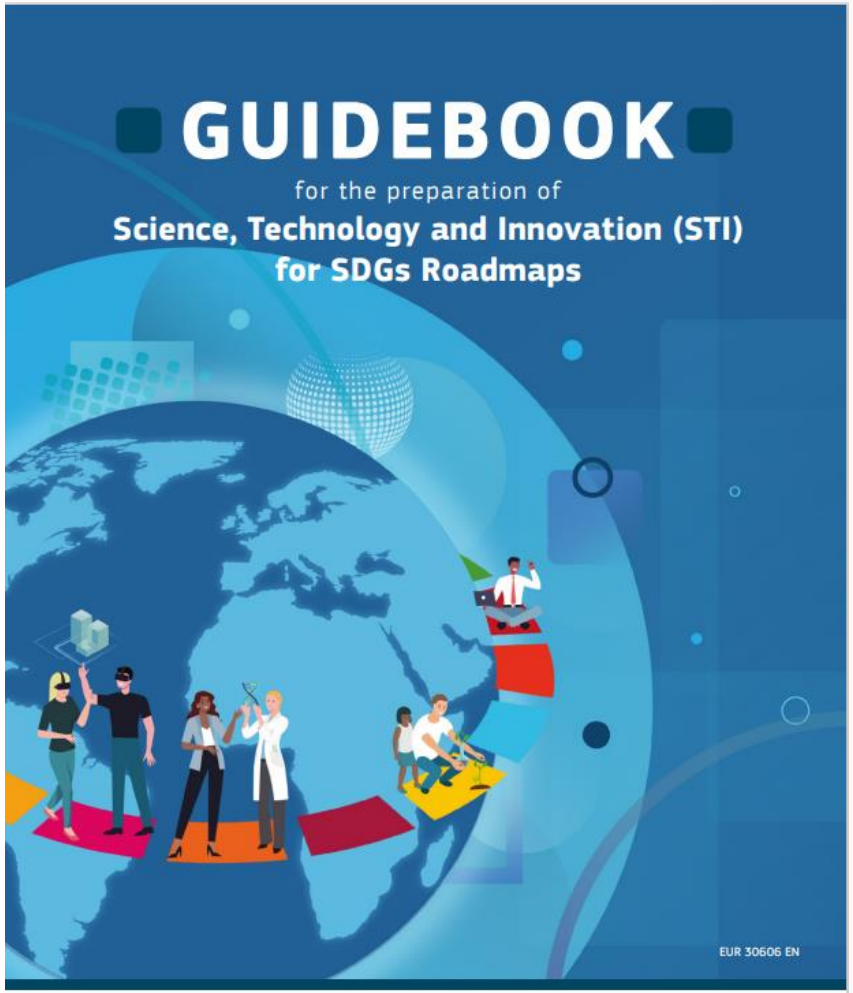
STI in Africa Coalition

https://s3platform.jrc.ec.europa.eu/sustainable-development-goals
https://sdgs.un.org/tfm

European Commission

Guidebook for the preparation of STI for SDGs roadmaps

- The Guidebook is designed to facilitate the development of STI for SDGs Roadmaps by providing a framework, common language and step-by-step advice for practical policymaking and communication purposes.
- The Guidebook focuses on the design stage of the roadmaps, demonstrating that the design underpins effective implementation and monitoring.
- The Guidebook was used by a first set of countries that were part of the Global Pilot Programme launched in 2019
- JRC has translated the guidance provided in the Guidebook into a methodology that aims at developing challenge-led STI roadmaps based on place-based approach.



https://publications.jrc.ec.europa.eu/repository/handle/JRC124108

European Commission

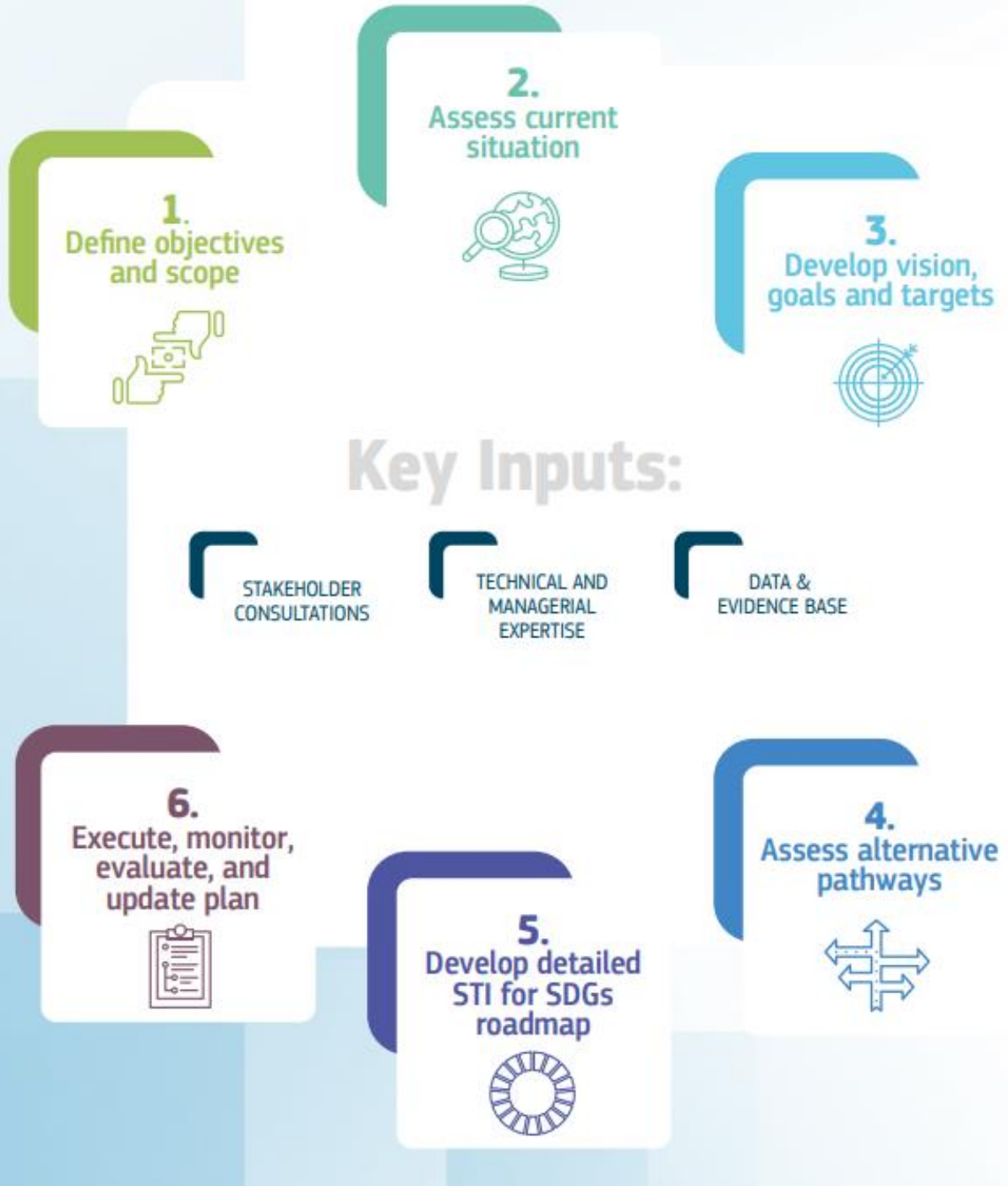
The approach

JRC provides **methodological guidance** for the development of STI for SDGs roadmaps

Six steps to develop STI for SDGs roadmaps	**Tailored support** on specific steps based on country context and needs

prioritization of STI objectives to address the identified sustainability challenges

identification of instruments, **projects and investments to deliver green and digital transitions and Agenda 2030**



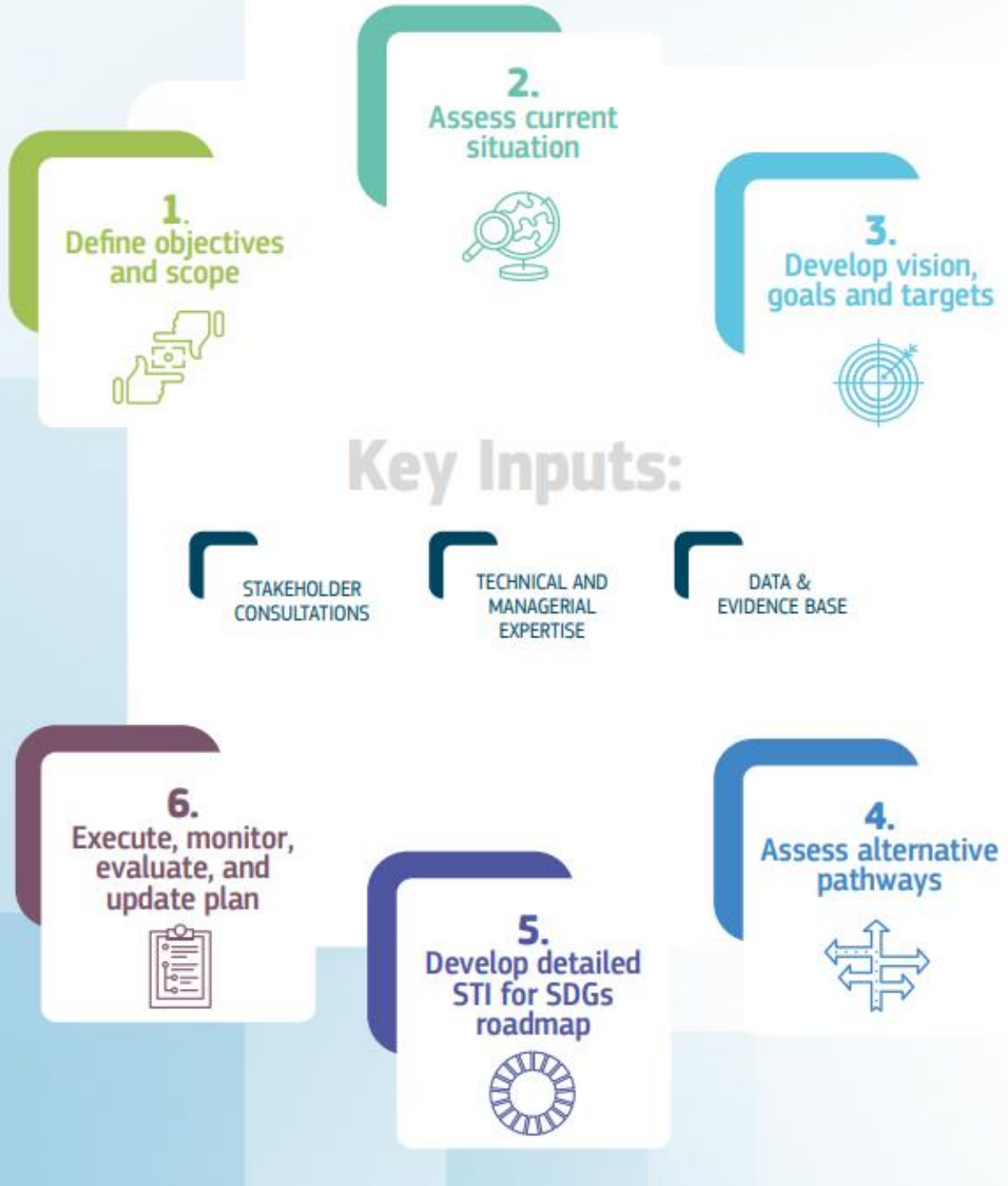
Key methodological features

Identification of the sustainability challenge of focus with the country team

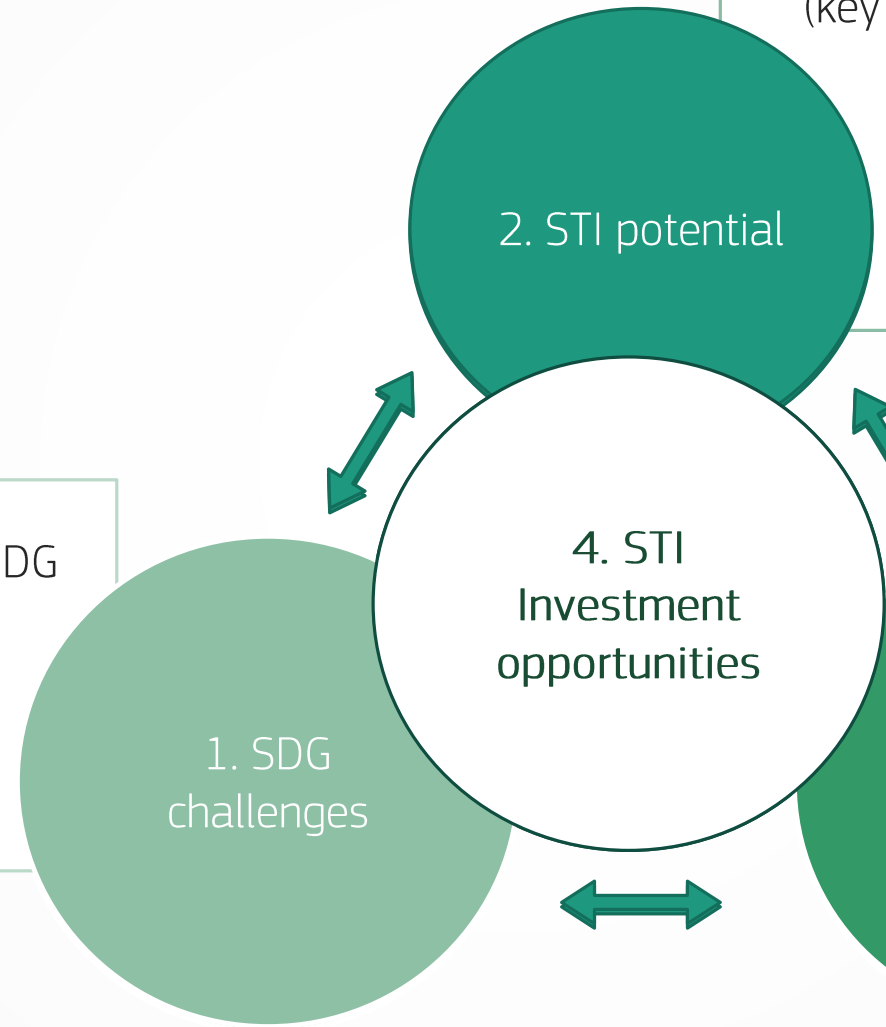
Diagnosis based on four key pillars

Use of co-creative and participatory approaches to gather information and build consensus on STI areas for investment

Joint deliberation of the action plan



Diagnosis: four main pillars



- Quantitative analysis (key figures on STI and socio-economic performance)
- Qualitative analysis (literature review; case studies; interviews)

- Quantitative analysis (SDG indicators, etc.)
- Policy document review Literature review
- Interviews

- Stakeholder mapping
- Instruments mapping
- Interviews

Source. JRC

Participatory and co-creative approach

Participatory methods informing the roadmap

- Scoping interviews
- Online (hybrid) workshop
- Stakeholder and policy surveys
- In-person workshop
- In-depth interviews.

The case of Seychelles

European Commission

Defining and scoping the sustainability challenge:
Improve energy efficiency and application of renewable energy

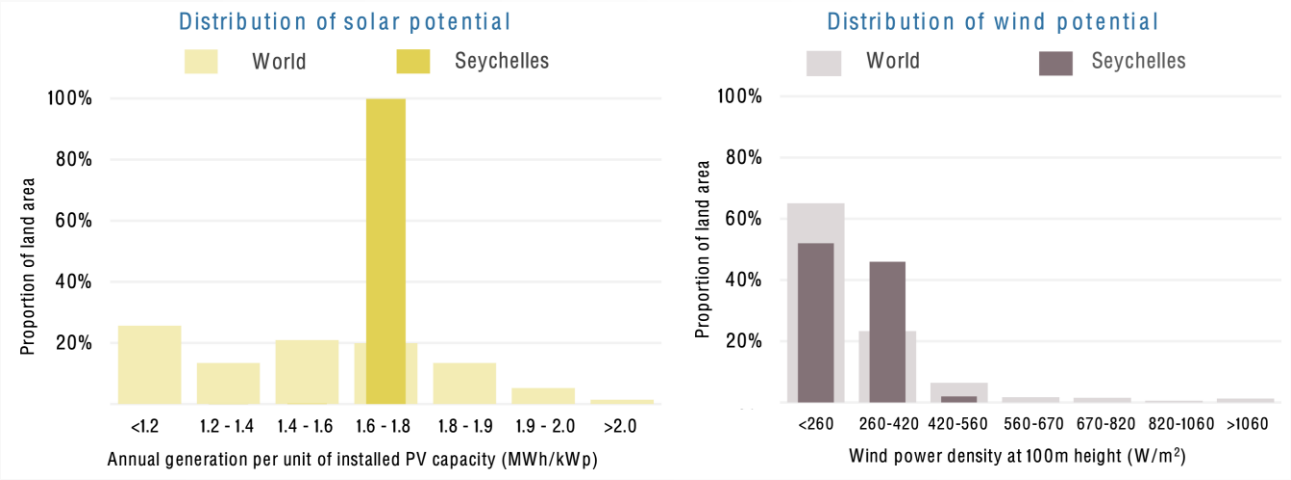
"The scope is to devise solutions using STI, targeting the ***enhancement of energy efficiency and application of renewable energy****, aligning with the objectives of Sustainable Development Goals – SDG 7 (Affordable and Clean Energy) and SDG 9 (Industry, Innovation, and Infrastructure) on an Island context. This encompasses the* ***development of technologies, systems, or methodologies*** *that demonstrably elevate energy efficiency across* ***diverse sectors*** *and provide solutions for* ***high energy consumption from cooling****. Potential areas of focus include but not limited to the* ***creation of smart energy management systems****,* ***energy efficient Industrial processes****, designing* ***smart grids*** *or developing* ***cutting-edge methodologies for industries*** *and novel approaches to* ***curtail energy wastage****. The overarching goal is to actively contribute to sustainable development by emphasizing and advancing initiatives that prioritise energy efficiency that not only reduces energy consumption but also contributes significantly to sustainable and inclusive economic growth."*

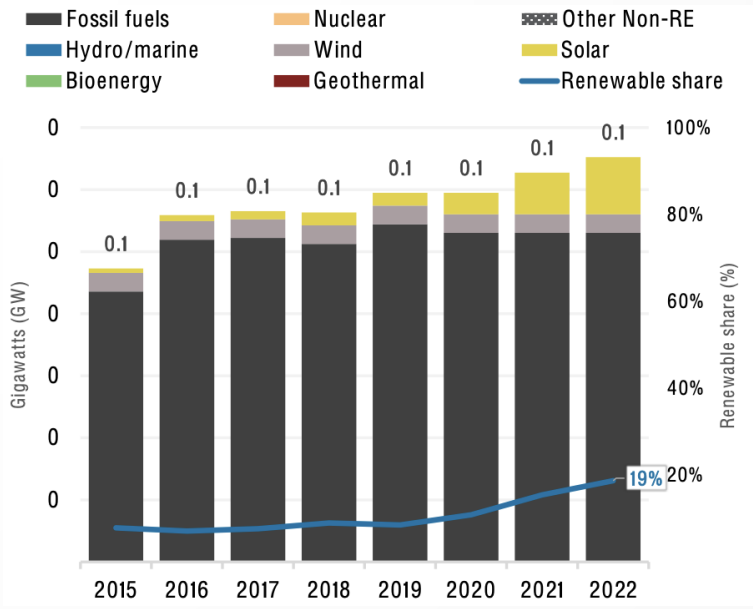
Country team: Division of Science, Technology and Innovation within the Ministry of Investment, Entrepreneurship and Industry

Analysis of sustainability challenge

1. SDG challenges

- Heavy reliance on imported fossil fuels
- Inefficiencies in electricity production
- Rising electricity demand with limited renewable energy integration
- Policy documents and legislations already in place





Source: IRENA, 2023

European Commission

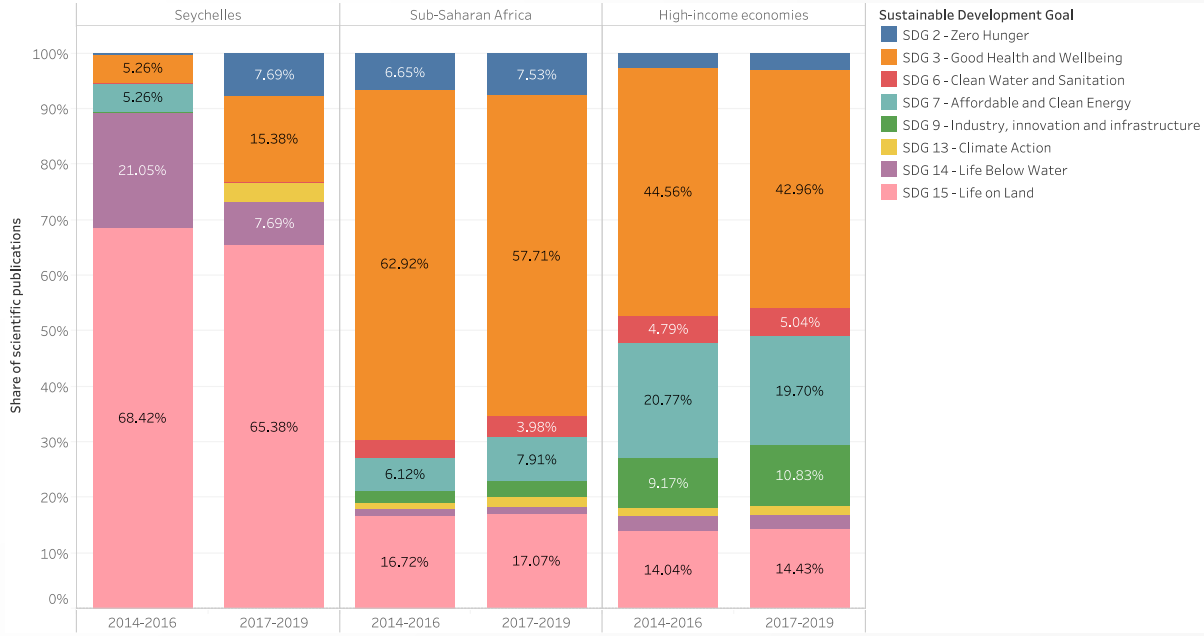
STI Landscape in Seychelles

2. STI potential

- GERD much below 1%, mainly relying on government expenditure
- Small number of researchers
- Publications on 'Affordable and Clean Energy' declined in 2014-2019

Indicator	2018
GERD as share of GDP	0.22%*
Share of R&D expenditure performed by Government	88.23%
Share of R&D expenditure performed by Higher Education	4.75%
Share of R&D expenditure performed by Private non-profit	7.02%
Researchers per million inhabitants (HC)	149
Share of female researchers (HC)	34.9%

*Data from 2016
Source: UNESCO Institute for Statistics. 'UIS Database', 2023;



Source: UNESCO, 2021

European Commission

STI in existing policies on Energy transitions

3. STI policy mix

National Climate Change Strategy (NCCS) (2009),	• provided a framework and guidance for all climate-related works and actions in the country. • Set the basis for NCCP
National Climate Change Policy (NCCP) (2020),	• set the objective of achieving sustainable energy security and reducing greenhouse gases. through diversification of the energy portfolio towards renewable forms of energy; • modernise the energy legislation to encourage innovation and transfer of technology in the energy sector; promote technology transfer in the energy production and transport sector
Seychelles Blue Economy Strategic Policy Framework and Roadmap (2018)	• promoting sustainable energy practices and technologies within the context of the blue economy
The Energy Act (2012)	• promotes of renewables across all sectors
Energy Efficiency Act (2019, not enforced)	• mandates the formation of an Energy Efficiency Committee to oversee the implementation of policies • identifies incentives and financial schemes to support energy efficiency measures
Utilities Regulatory Commission Act (2023)	• promoting the use of renewable energy and improving water and energy efficiency as part of its objectives
Regional and international frameworks and strategies	• SDGs - United Nations and the Agenda 2063 - African Union

STI policy landscape in relation to the challenge area (selected initiatives)

3. STI policy mix

National STI Policy and Strategy 2016-2025

- Envisions a "knowledge-driven, innovative, prosperous and pristine Seychelles"
- Mission: to integrate STI into the country's socio-economic transformation, aiming for sustainable growth and improved quality of life
- Focus areas for development and investment include blue economy, education, environment, and health
- Calls for a concerted effort from all ministries, departments, the private sector, and civil society

DSTI Programmes

- **Education & Knowledge Management Programme:** builds a national database of scientific activities and promotes knowledge sharing
- **Technology Programme**: oversees technology advancement, intellectual property protection, and market strategy for local innovations
- **Innovation Programme**: encourages the national uptake of innovation by providing a supportive environment for the incubation and commercialisation of ideas
- **Research and Development Programme**: coordinates national R&D efforts and fosters collaboration with international research entities

Other National Programmes

- **Seychelles Energy Efficiency and Renewable Energy Programme (SEEREP)**: subsidised loan for households and SMEs to access capital for energy efficiency and renewable energy technologies
- **National Grants Funding Scheme**: offers grants to registered non-profits for projects that advance national priorities and select SDGs
- **The Blue Grants Fund**: provides grants to projects in different sizes to Seychelles-based NGOs, government entities, parastatal organisations, and businesses
- **Global Entrepreneurship Week**: promotes entrepreneurship and includes presentations, fairs, and talks

International Organisations Initiatives

- **UNDP Climate Promise Initiative**: supports countries in enhancing their Nationally Determined Contributions (NDCs) under the Paris Agreement
- **Climate Investment Platform (CIP):** increases the flow of capital to developing countries to **meet their climate goals**
- **The Small Grants Programme (SGP):** supports community-led initiatives that focus on sustainability and socio-environmental impact
- IRENA ADFD program: supports renewable energy projects in developing countries, including Seychelles
- Governance and Economic Reforms Support Programme (Phase III): strengthens Seychelles' response to climate change and the transition to clean energy
- DSTI Incubation Programme: supports innovation and entrepreneurship within the blue economy sector

Identified gaps and opportunities in STI for Energy Sustainability

4. STI Investment opportunities

BARRIERS

- Policy and regulatory barriers
- Funding and institutional capacity limitations
- Shortage of skilled professionals and research infrastructure
- Cultural and awareness challenges

OPPORTUNITIES

- Expansion of solar energy utilisation
- Smart grid technology development
- Strengthening workforce skills
- Leveraging international partnerships and private sector for R&D and innovation

Participatory Identification of STI Investment Areas

GROUP …: Selection and prioritisation of STI areas	Criteria/Score (3: Very high, 2: High 1: Low)					
Potential STI focus areas for energy efficiency and renewable energy	**Relevance to challenge-related needs of the country**	**Skills availability/ ease of skills development**	**Finance availability/ ease of raising funds**	**Infrastructure readiness for development/ adoption**	**Potential collaborators for development/adoption (national and international)**	**Potential funders/donors (national and international)**
1. Renewable energy						
• Advanced Photovoltaic (PV) Technology: Innovations to increase solar power efficiency and accessibility.						
• Wind Turbine Technology: Advances in design and materials for more efficient wind energy.						
• Hydroelectric Technology: Enhancing traditional hydroelectric power generation with new turbine designs and low-impact hydrodynamic systems that minimize environmental disruption.						
• Marine and Hydrokinetic Energy: Harnessing the kinetic energy of ocean currents, waves, and tidal forces to generate electricity.						
• Hydrogen and Fuel Cell Technologies: Utilizing hydrogen as a clean energy carrier.						
• Geothermal Energy Technology: Developing more efficient geothermal systems for heating and cooling.						
• Biotechnology for Biofuels: Enhancing biofuel production efficiency using genetic engineering.						
• Battery Technology and Energy Storage: Improving storage capabilities for renewable energy.						

+ Group discussions on non-technological innovation

+ Group discussions on the place-specific factors

Seychelles' STI roadmap to improve energy efficiency and the uptake of renewables (selected examples)

Rationale	Actions	Lead	Partners	Output and expected outcomes	Timing for initiation
Policy and regulatory reform Weak governance system and framework	1. Renewable Energy and Eco-Innovation Council (REIC)	Office of the Vice President *DSTI to act as the Secretariat of the Council*	Ministers; PUC and URC heads; presidents of higher education institutes; representatives of private sector and NGOs	An effective platform to develop, improve, oversee, and align policies and policy instruments, including regulations (e.g. removal of restrictions in renewable use in commercial sector, enabling IPP projects, etc.), to enhance energy efficiency and use of renewables	Short term
Skills and infrastructure enhancement Insufficient human resources and infrastructure Leveraging global expertise through partnerships and diaspora	2. Renewable Energy and Eco-Innovation Diaspora Network	DSTI under the auspice of GEIC	MoFEPT; MoACCE, MLGCA; PUC; URC; UniSey; SIT; SeyPoly; private sector and NGOs	An engaged global network of Seychellois specialists and professionals contributing to knowledge and technology transfer, fostering investment opportunities, and establishing international partnerships in the sector.	Short term

The roadmap includes 13 proposed actions

Policy recommendations

Integrate Energy and STI Policies	Integrate Science, Technology, and Innovation (STI) policies with the energy sector to facilitate systemic transformation and application of innovative energy solutions, and remove barriers to renewable energy adoption.
Strengthen Governance and Regulatory Frameworks	Establish stronger governance structures and inter-sectoral coordination to unify efforts and address energy challenges more effectively, and implement and enforce energy efficiency standards and regulations
Establish Sustainable Funding Models	Establish consistent funding streams and enhanced institutional capacity to implement STI programs effectively, and provide robust financial incentives and support programs to encourage the adoption of energy-efficient appliances and renewable technologies.
Develop Workforce Skills and Research Infrastructure	Strengthen workforce skills in renewable energy and energy efficiency through targeted education programs, retraining of energy auditors, and capacity building in retrofitting practices, and establish a centralized energy research database to inform strategic planning and decision-making.

Conclusions

Getting Started and Securing Stakeholder Engagement

- Secure early political commitment to ensure stakeholder buy-in and lay a strong foundation for the roadmap process.
- Clearly communicate expectations towards the roadmaps to scope and align later steps.
- Assess the policy space to position and embed the roadmap in existing policy processes.
- Assemble a skilled and motivated team with the necessary skills and resources to drive the process forward effectively.

Participatory Deliberation and Evidence-Based Policymaking

- Facilitate inclusive deliberations on alternative STI pathways to ensure a comprehensive evaluation of available options.
- Compare the benefits and disadvantages of different innovation pathways to inform decision-making.
- Develop a comprehensive evidence base to support building shared understanding among stakeholders.
- Utilize participatory tools to identify and prioritize innovations and assess their potential impacts.

Embedding Roadmaps into STI Policy and Governance

- Integrate the roadmap into existing policies and plans to ensure coherence and effectiveness.
- Establish coordination mechanisms to give a common direction and ensure coherence in a portfolio of actions.
- Foster new inter-ministerial collaborations and multi-stakeholder partnerships to mobilize STI to address challenges.
- Embed capacity building into the roadmap implementation process to strengthen capabilities and promote collective ownership

Thank you

angela.sarcina@ec.europa.eu

European Commission