Sustainable deployment of renewable energy using a water-energy nexus approach

Cross-cutting and inter-sectoral cooperation to integrate renewable energy into energy systems

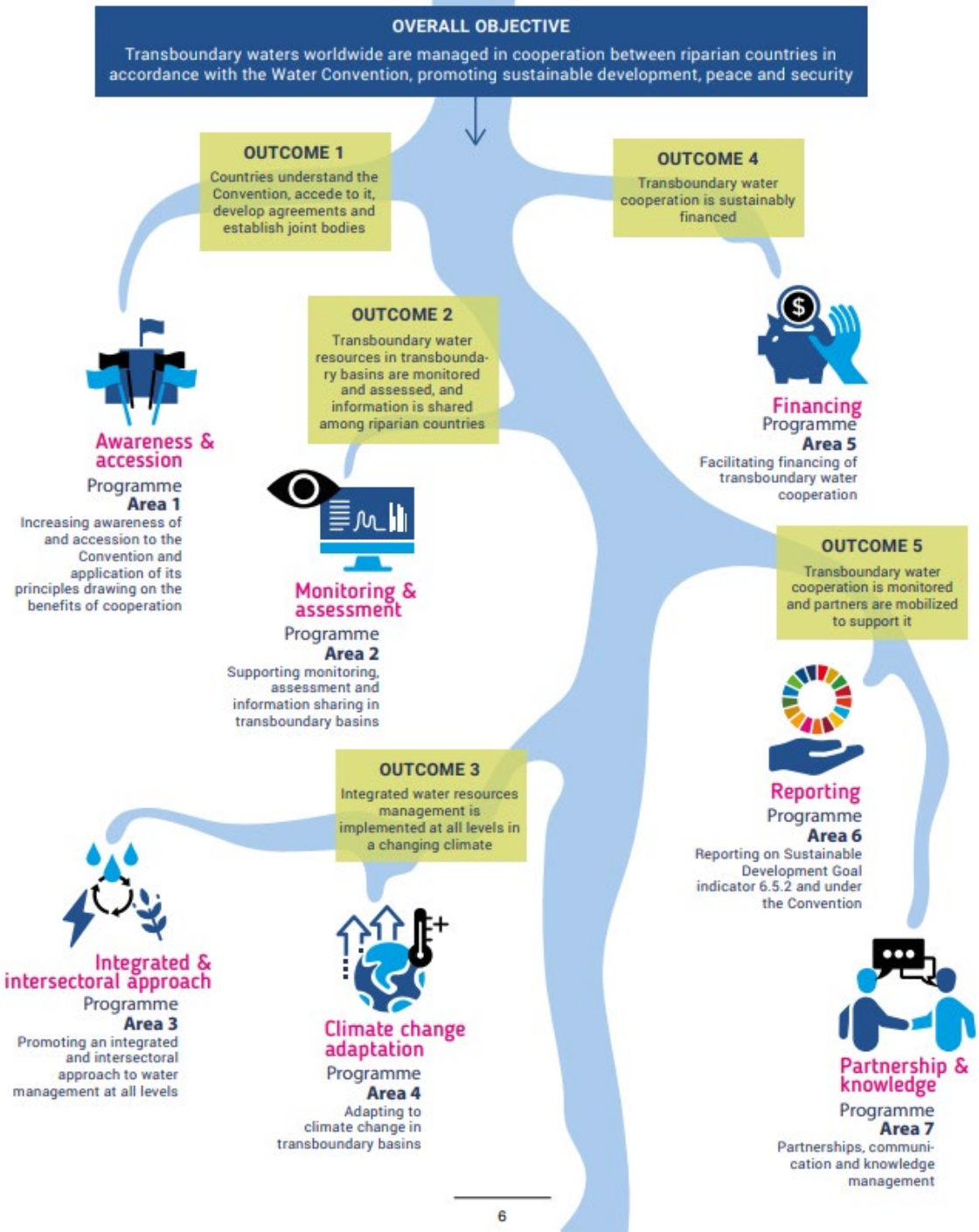
Lucia de Strasser – Environmental Affair Officer, UNECE (Water Convention)

Vassilis Triantafillos – Hellenic Ministry of Environment and Energy

Water Convention (*Convention on the Protection and Use of Transboundary Watercourses and International Lakes*)

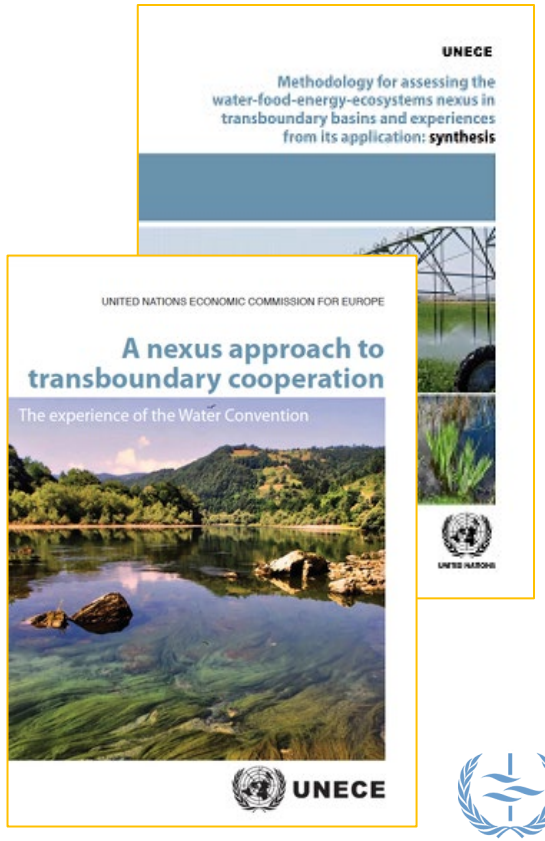
- Supports transboundary cooperation through:
  - A legal framework
  - An institutional framework
  - Projects on the ground *(e.g. nexus assessments of transboundary basins)*

- Global convention (open to all UN member states), secretariat hosted by UNECE in Geneva
- 9th Meeting of the Parties 29 September-1 October -> new Programme of Work 2022-2024


OVERALL OBJECTIVE
Transboundary waters worldwide are managed in cooperation between riparian countries in accordance with the Water Convention, promoting sustainable development, peace and security
OUTCOME 1
Countries understand the Convention, accede to it, develop agreements and establish joint bodies
OUTCOME 2
Transboundary water resources in transbounda-ry basins are monitored and assessed, and information is shared among riparian countries
OUTCOME 3
Integrated water resources management is implemented at all levels in a changing climate
OUTCOME 4
Transboundary water cooperation is sustainably financed
OUTCOME 5
Transboundary water cooperation is monitored and partners are mobilized to support it
Awareness & accession
Programme
Area 1
Increasing awareness of and accession to the Convention and application of its principles drawing on the benefits of cooperation
Monitoring & assessment
Programme
Area 2
Supporting monitoring, assessment and information sharing in transboundary basins
Integrated & intersectoral approach
Programme
Area 3
Promoting an integrated and intersectoral approach to water management at all levels
Climate change adaptation
Programme
Area 4
Adapting to climate change in transboundary basins
Financing
Programme
Area 5
Facilitating financing of transboundary water cooperation
Reporting
Programme
Area 6
Reporting on Sustainable Development Goal indicator 6.5.2 and under the Convention
Partnership & knowledge
Programme
Area 7
Partnerships, communi-cation and knowledge management
6

Rationale of nexus work under the Water Convention: Promoting transboundary cooperation by…

- **Overcoming "silos thinking"** in policy making and natural resource management:
  - reduced friction between sectors and countries
  - reduced economic losses from inefficiency
  - enhanced sustainability
- **Co-optimizing the use of** existing and new **infrastructure**:
  - benefits to different sectors
  - lower resource use intensity
- **"Nexus-proofing"** legal, institutional, and policy **frameworks**
- Motivating **information sharing and consultation in transboundary contexts**, and considering alternatives
- Highlighting the **broad benefits** of intersectoral and transboundary **cooperation**

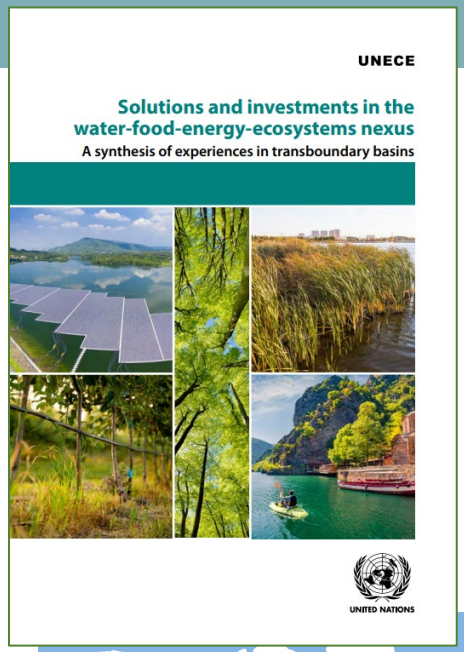


Nexus activities under Water Convention

Exchange of experience in the **Task Force on the Water-Food-Energy-Ecosystems Nexus** (22-23 October 2020); **policy support and tools**

Assessments of the water-food-energy-ecosystems nexus; assessment **methodology** (flexible and adaptable framework, participatory process in close cooperation with Governments, involving different sector Ministries)

Support countries in the **operationalizing nexus solutions & investments**, in **regional/basin strategies**



* United Nations administered territory under the UN Security Council Resolution 1244 (1999)

Water-energy coop. focused on Renewable Energy

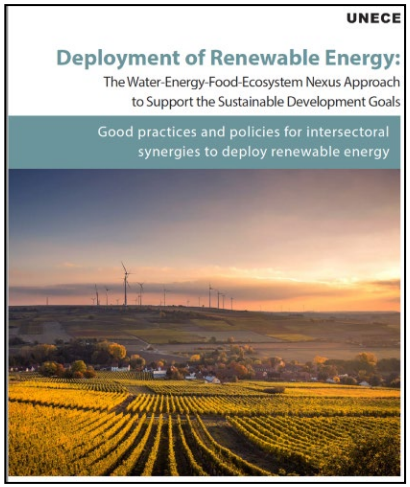
- Why? All RE has transboundary impact, and hydro competitiveness needs to be better understood
- Cooperation between **Environment** and **Sustainable Energy** Divisions at **UNECE**

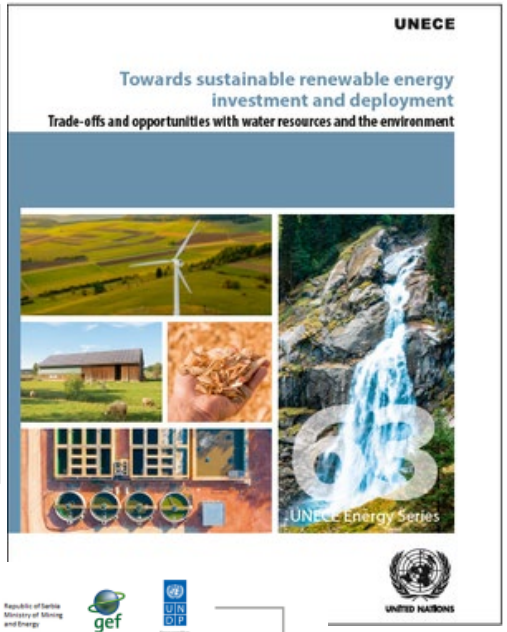
➢ Policy Brief on RE, nexus and SDGs (UNECE, 2017)

- **"Renewable Energy Hard Talks"** considering water and environment (follow-up to **Drina Nexus Assessment** 2016)
  - ✓ Bosnia and Herzegovina 2018
  - ✓ Serbia 2019

➢ Sustainable RE Deployment – a «toolkit» for Policy Makers (UNECE, 2020)

➢ Role of energy sector in the synthesys of «Solutions and Investments in the WEFE nexus» (UNECE, 2021)



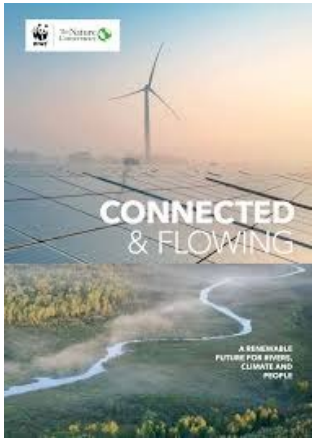


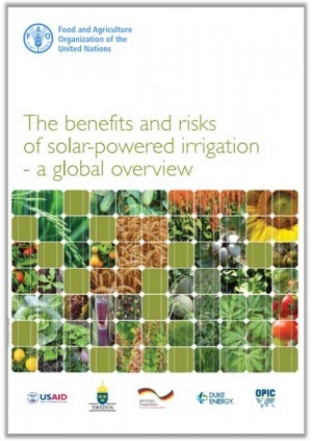
Increasing demands of water, food, energy – pressure on (transboundary) ecosystems

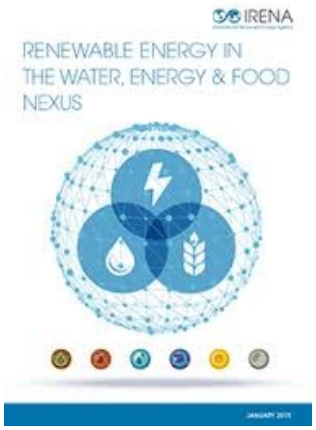
Demand of resources by 2050 and water-energy-food-ecosystem nexus

*"**energy**-related objectives can be achieved more effectively through integrated and consultative planning in **synergy with environmental and other sectoral objectives**, notably those of the water and agricultural sectors"*

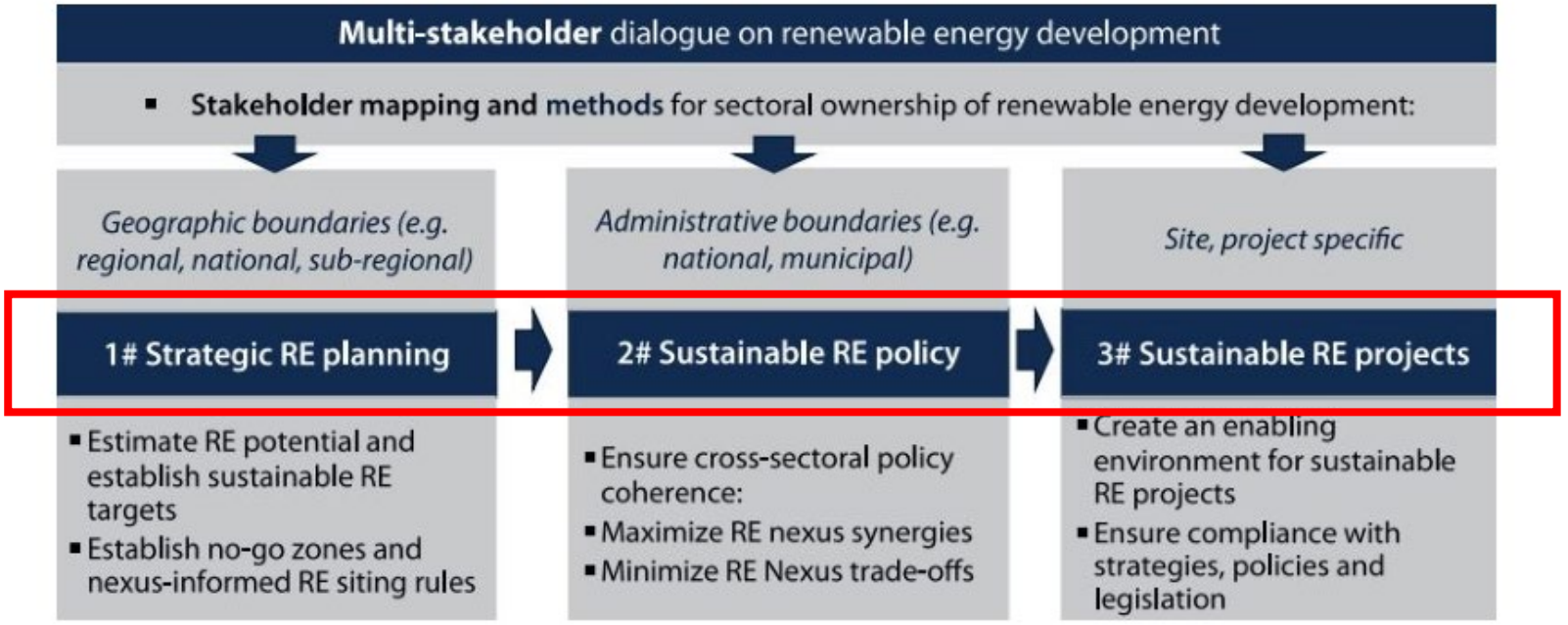
Same conclusion from different perspectives on RE deployment:







Sustainable RE deployment along 3 tracks

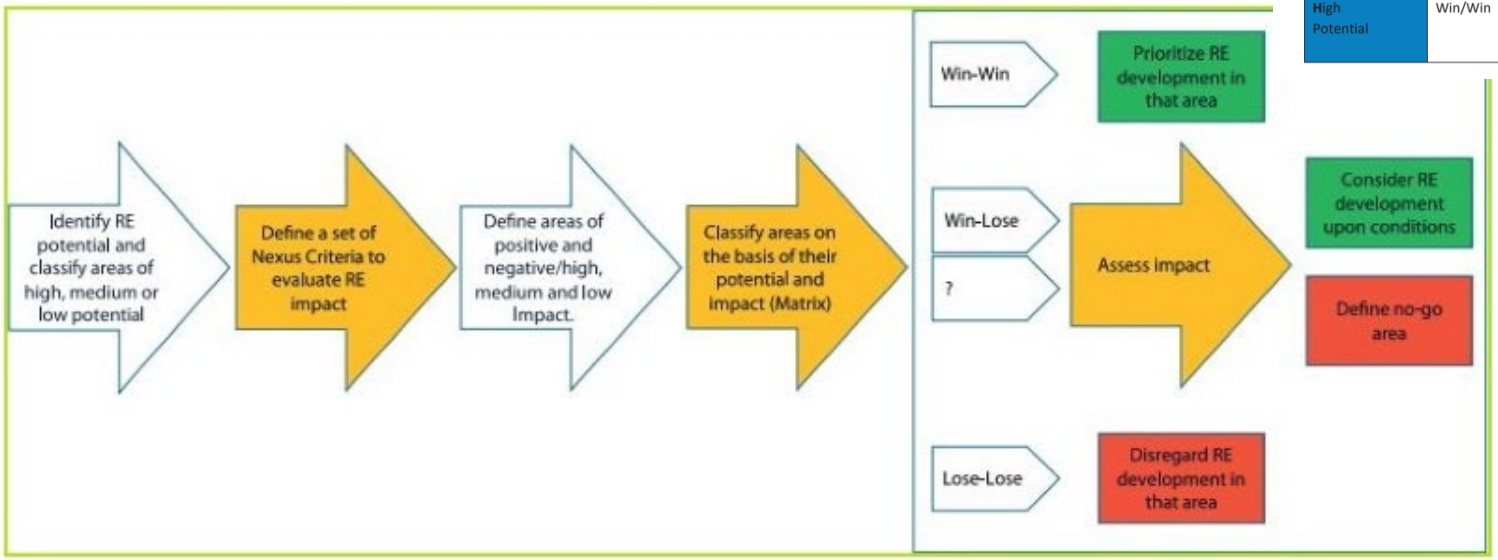


Multi-stakeholder dialogue and the three tracks of sustainable renewable energy development: planning, policy and project

#1 Sustainable RE strategy

Table 2: Potential/Impact Matrix

	Low Positive Impact	Medium Positive Impact	High Positive Impact	Low Negative Impact	Medium Negative Impact	High Negative Impact
Low Potential	Uncertain	Uncertain	Uncertain	Lose/Lose	Lose/Lose	Lose/Lose
Medium Potential	Win/Win	Win/Win	Win/Win	Win /Lose	Win /Lose	Win /Lose
High Potential	Win/Win	Win/Win	Win/Win	Win /Lose	Win /Lose	Win/Lose



Step-by-step process for strategic planning. The steps that require strong involvement on the part of cross-sectoral stakeholders are indicated in yellow.

#2 Sustainable RE policy

Figure 8: Step-by-step process for sustainable renewable energy policy development

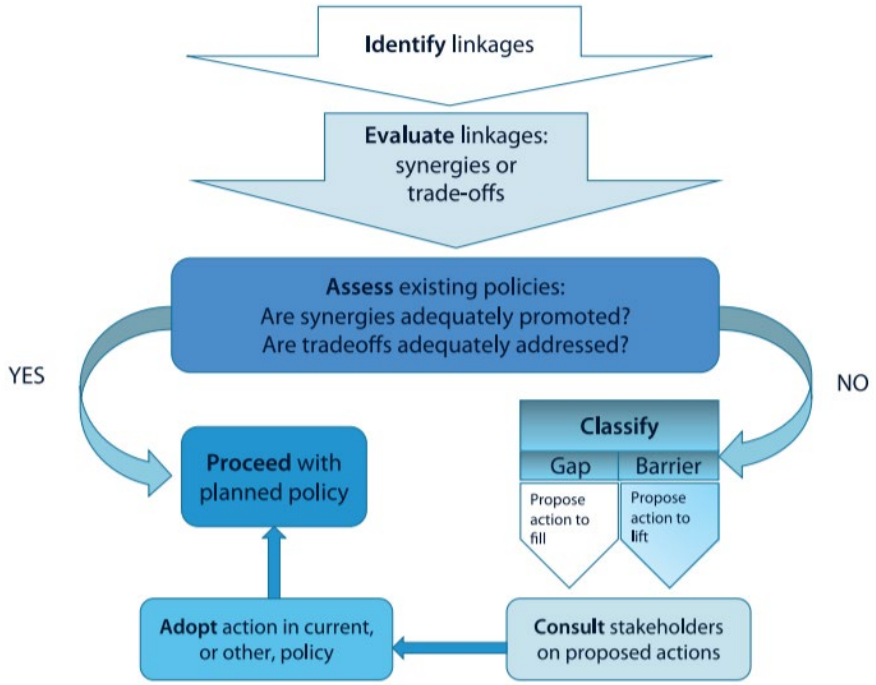


Table 4: The Sustainability Assessment Matrix

Nexus sectors	Synergies		Trade-offs	
	Identification	Assessment	Identification	Assessment
Water				
Water supply/services				
Water management				
Water infrastructure				
Agriculture and Forestry				
Land availability				
Land quality				
Rural development				
Agroforestry				
Ecosystems				
Natural environment				
Wildlife/habitats				
Indirect environmental impact of renewable energy				
Cultural impact				
Transboundary aspect				
Transboundary impact on water				
Transboundary impact on food/agriculture				
Transboundary impact on ecosystems				

#2 example

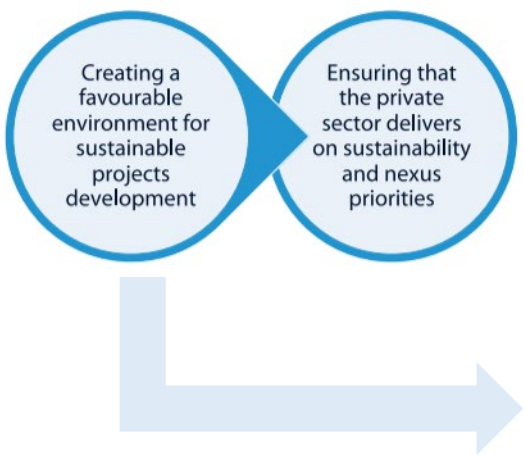
- Identification and assessment (gaps & barriers) of Synergies and Trede-offs between RE deployment and Agriculture through:
  - land availability
  - land quality
  - rural development

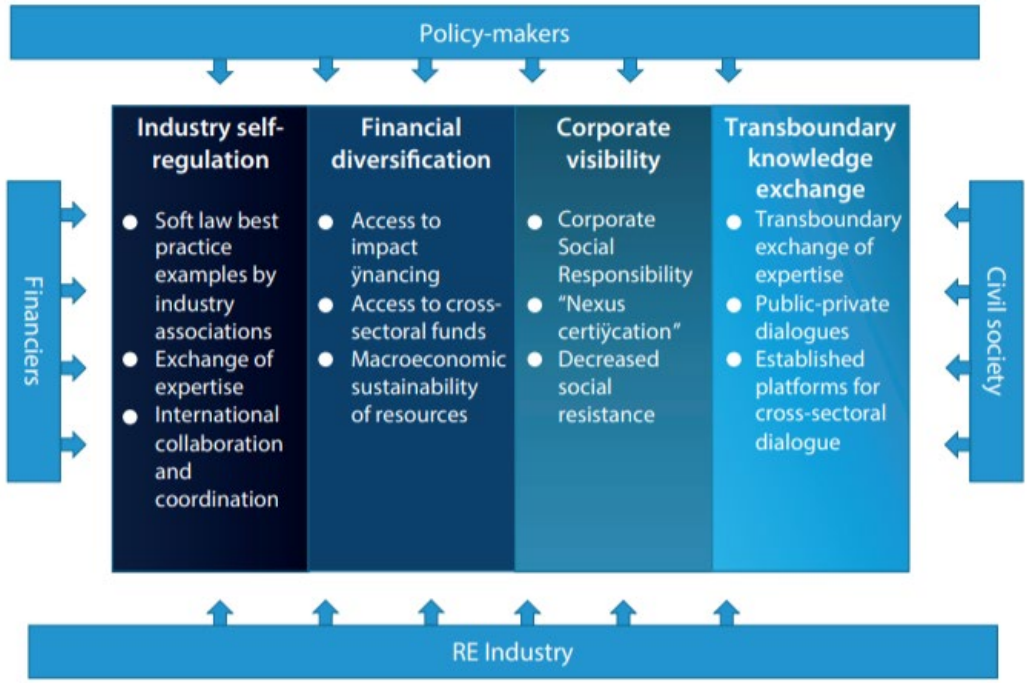
Nexus sectors	Synergies		Trade-offs	
	Identification	Assessment	Identification	Assessment
Agriculture				
Land availability	**IDENTIFIED**: Solar PV technologies exist that allow for elevated panels for farming, and also display synergies with increasing bee populations.	**GAP**: The policy can incentivize usage of elevated PV technologies for maximizing benefit from land usage. **BARRIER**: Land zoning rules that prevent Solar PV on farmland should include an exception for PV plants that use elevated technology.	**IDENTIFIED**: New PV installations will use land that could be exploited for farming, etc.	**ADDRESSED**: Zoning rules allow the installation of PV on lands already available for industrial usage or for integrated farming solutions.
Land quality	**NOT IDENTIFIED**	–	**IDENTIFIED**: PV plant parts and, particularly, storage equipment can adversely affect soil if improperly disposed after decommissioning	**GAP**: Obligation to recycle at decommissioning /after a fixed amount of years.
Rural development	**IDENTIFIED**: Small solar PV can provide alternative revenue sources and increased financial security to farmers.	**GAP**: A clause should be included in the proposed policy that makes permitting simpler for farmers that install small (<100 KW) PV plants. **BARRIER**: A tax law provision exists that does not allow farmers to enjoy certain tax exemptions if they have alternative revenue from non-farming activities.	**IDENTIFIED**: Easier income due to solar subsidies can disincentivize local agricultural populations from becoming involved in more physically demanding and financially unstable agricultural professions. **IDENTIFIED**: Local communities often react to large-scale RE installations.	**GAP**: Increase the living standards of agricultural workers, and promote the modernization of farming activities through incentives for modern equipment and supply chain processes. **GAP**: Include a requirement for all projects above a certain size to pay contributions to local communities/ municipalities

Example of implementation of the Sustainability Assessment Matrix

#3 Sustainable RE projects

Figure 9: Two-step process for sustainable renewable energy project development (policy-maker perspective)





Multi-stakeholder involvement

including through transboundary dialogue

Concluding remarks

- RE deployment with water and environment benefits can effectively deliver on **climate action** (mitigation + adaptation)
- Sustainable RE planning comes is **spatial**
- Action is needed **at many levels** to ensure coherence and synergy between different policies.
- **Many stakeholders** need to bring their perspective: inclusive and effective public participation is necessary
- **Transboundary cooperation** could contribute to facilitate RE deployment at regional level, sustainably and efficiently
- Inclusion of nexus and energy-water-climate in the new **Programme of Work** (2022-2024)
- Interest to **implement the tool-kit** in specific basins?

Case study: Examples of multi-stakeholder involvement in decision making from Greece

#1 Strategic RE Planning

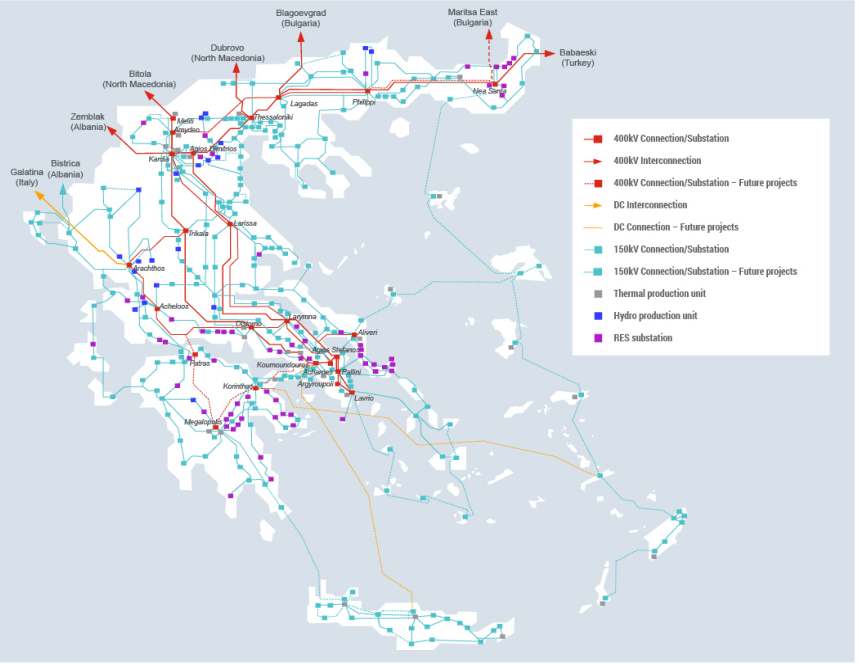
→ Revision of the NECP

#2 Sustainable RE Policy

→ **Island Decarbonization Fund**

#3 Sustainable RE Projects

→ Offshore Wind Framework



Key Stakeholders and Tools for multi-stakeholder involvement

Stakeholder mapping	*Tools*
Energy **Environment** **Water** **Agriculture** **Fisheries** **Tourism**	**Multi-stakeholder, intergovernmental Committee** **Official communications** **Bilateral meetings** **Consensus on draft before circulation**
Prefectures **Municipalities** **NGOs (environment, social, etc)** **Professional Organisations**	**Workshops** **Bilateral meetings** **Involvement of International NGO's** **Transfer of experience** **Call for Proposals** **Benefits for local economy**