The nexus and transboundary dimensions of renewable energy development: trade-offs and synergies

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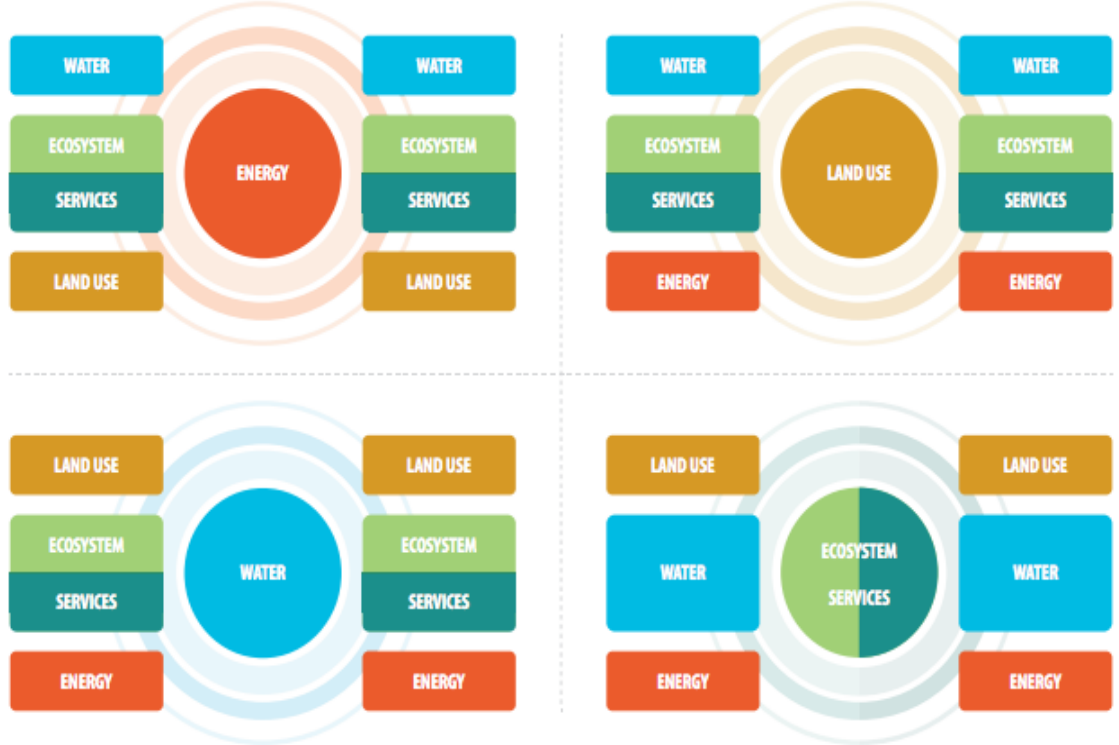
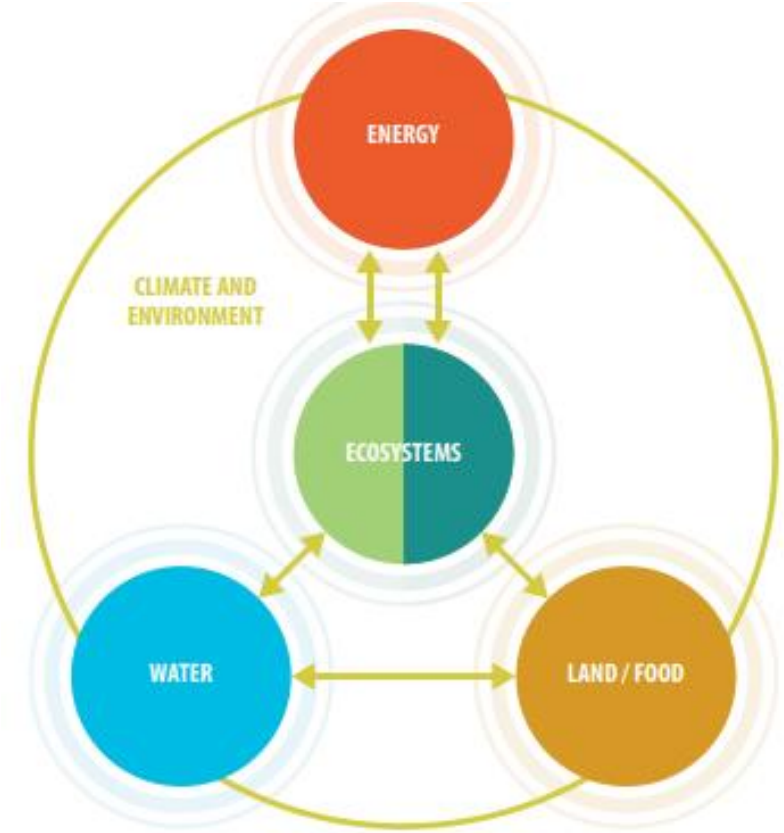
Renewable Energy Hard Talk Serbia

Belgrade 21-22 March 2019

Nexus dialogue





trade-offs, impacts, synergies

Some insights from discussion at the Hard Talk - policy

- Social acceptance risk is very high for RE, including when small and decentralized (NIMBY)
- Are energy prices too low? A political issue when energy poverty is high
- Long term strategic directions need to be clearer!
- Reducing risk more important than increasing financial return

Some insights from discussion at the Hard Talk - technologies

- Biomass, bioenergy, bioeconomy: value beyond production: job creation/rural development, waste mgmt, etc.
- Energy crops in unused land: tradeoffs with water, land, and environment?
- Solar sector struggling because of a lack of incentives, and still some are investing because it's becoming cheap
- Future wind and solar developments: issues of land tenure
- Small hydropower a controversial topic
- Geothermal potential basically unexploited
- Don't forget efficiency..

Which risks can we reduce with a nexus approach?

- Social acceptance risk
  - Effective public consultation/participation
  - Empowerment: Consumers to Prosumers?
- Political risk
  - Clearer long term targets
  - Greater coherence among sectoral plans

Example 1 micro-hydro in existing infrastructure (Netherlands)

Rehabilitation saving construction costs, minimizing environmental impacts and negative public image

Water Infrastructure

Municipal and agricultural water systems

- Drinking water supply
- Sewage
- Treated wastewater
- Storm water (Urban runoff)
- Irrigation water

Dams, hydropower and other plants

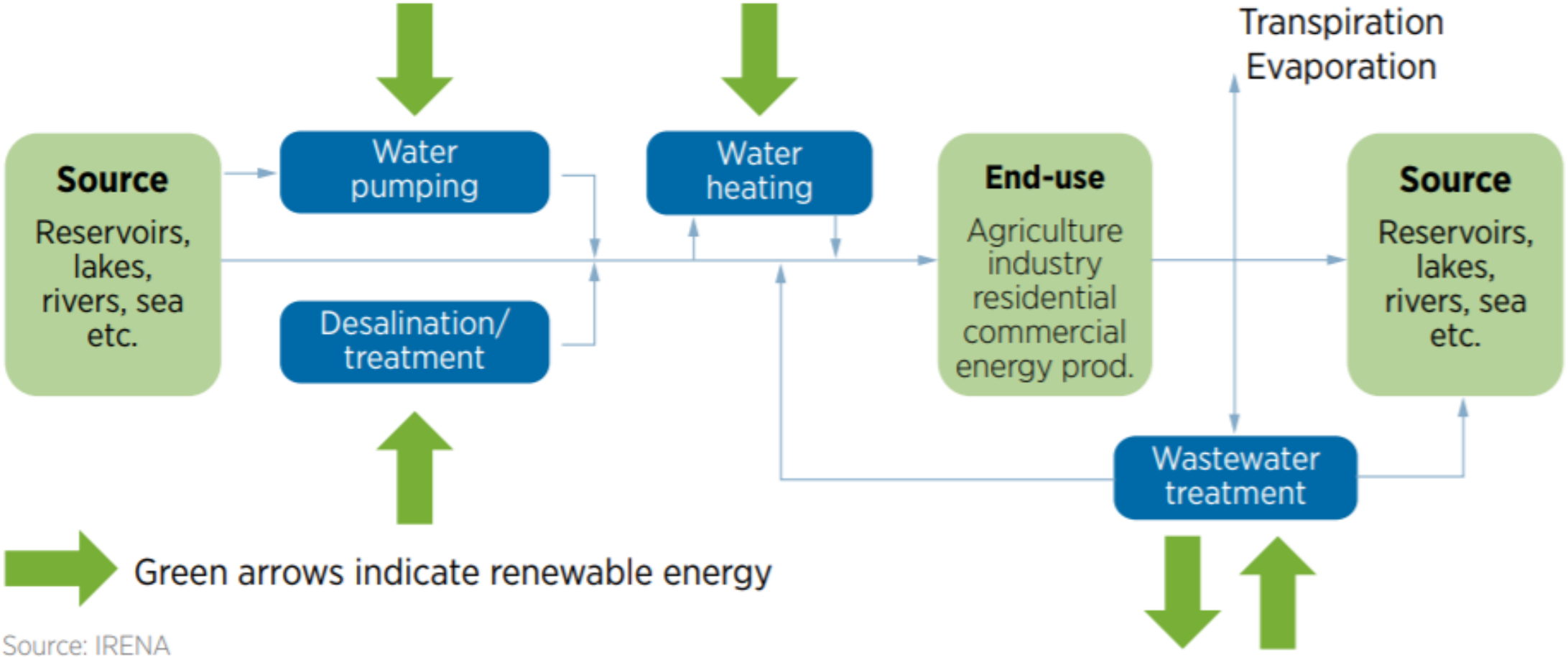
- Reserved flow and compensation on the toe of hydropower dams or water treatment
- Fish pass systems
- Navigation locks and dams

Hydraulic circulation systems

- Cooling and heating systems
- Desalination plants

See Integration of hydropower plant within an existing weir – “a hidden treasure” (Marence and Ingabire, 2016)

Figure 2.2 Renewable energy across the water supply chain



Source: IRENA

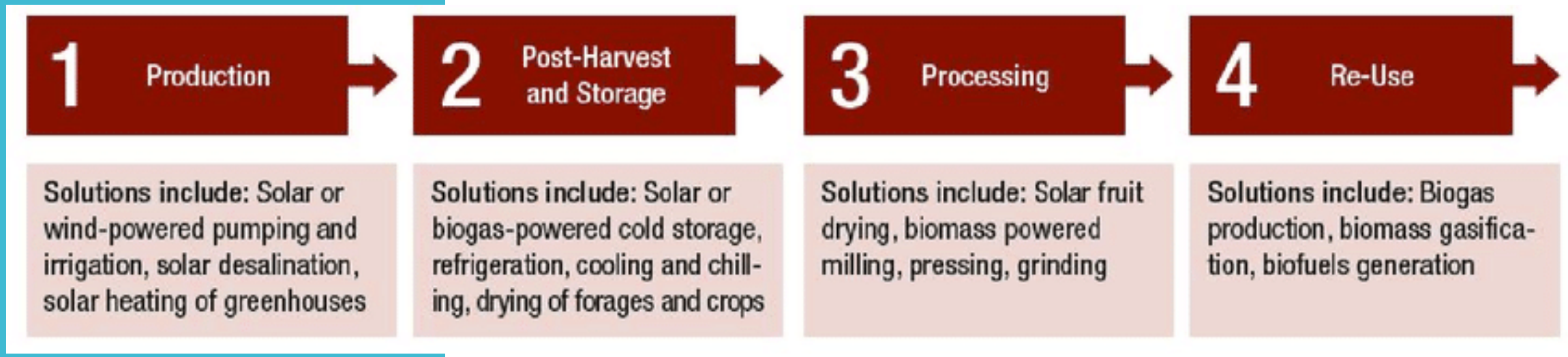
Example 2 decentralized RE production and "smart" distribution (Italy)

- *SEV South Tyrolean Energy Association* *: a platform for small and medium-sized energy service providers to: aggregate power, manage administrative burden, lobby..
- Entirely RE: heat (biomass) and power (small hydro), to satisfy local demand and sell extra energy
- Link to existing agricultural/forestry/tourism businesses and/or stimulate their sustainable development (and ideally existing cooperatives)
- A possible scheme for deploying RE (including solar) in rural areas of Serbia?



*https://www.sev.bz.it/en/south-tyrol-energy-association/1-0.html

RE in AGRICULTURE

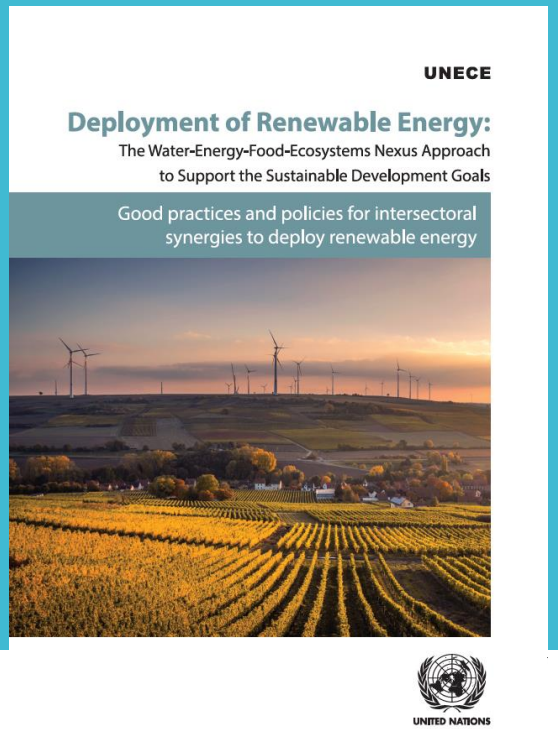


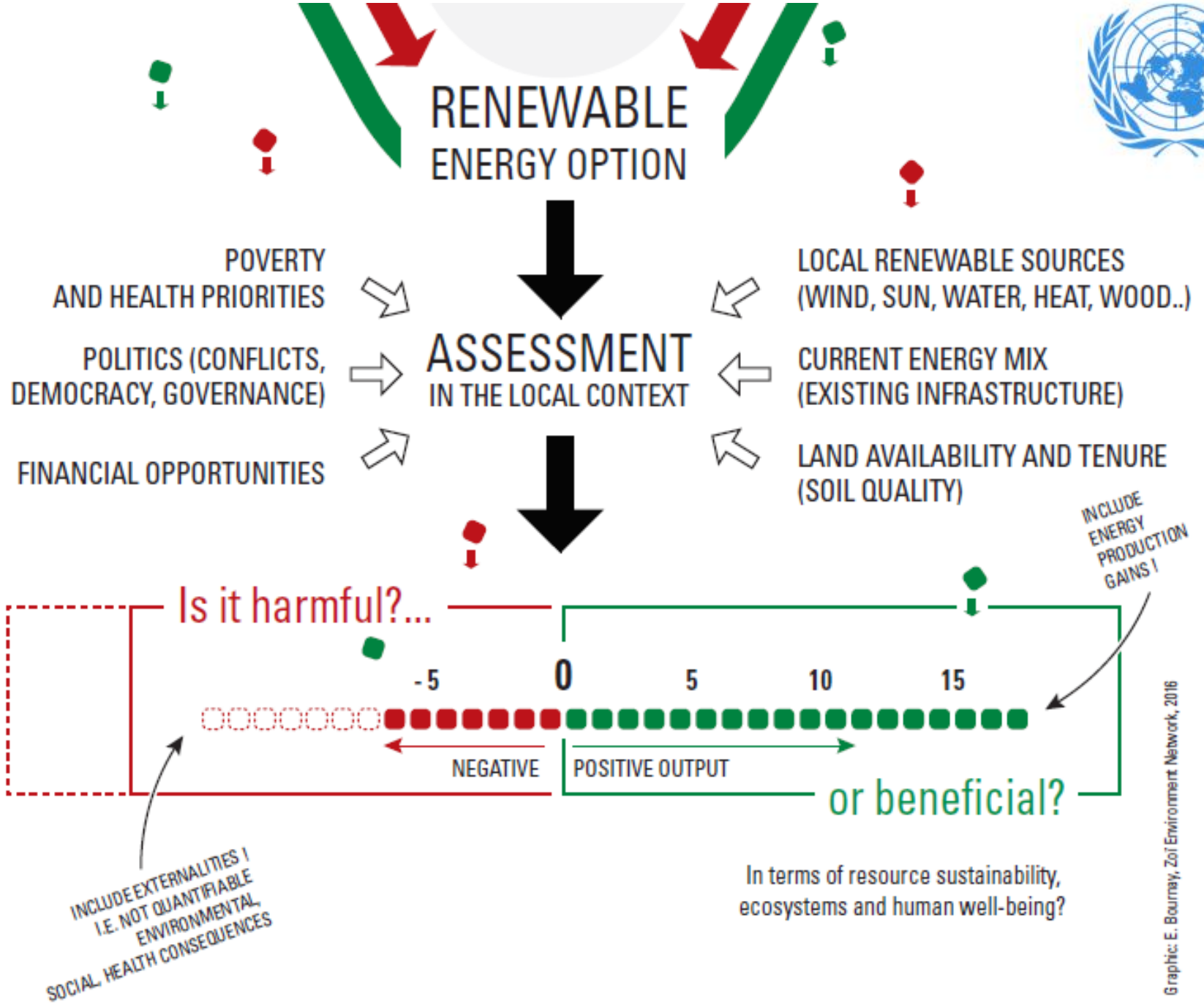
- Source: SEED, 2016. *Scaling Innovation at the Energy-Agriculture Nexus in East Africa. Sectoral Business Condition*

Example 3 RE investments to help addressing existing issues (Drina River Basin)

- Responses to floods are inadequate -> improve dam management? Nature-based solutions (floodplains, forests)?
- Waste is poorly managed – > valorize it?
- Lack of opportunities in agriculture/rural economy – > can RE investments add value to agriculture-, tourism-, forestry-related livelihoods?

A cost and benefits analysis that speaks to policy makers?





What's next from the Hard Talks?

- UNECE Guidance Document **«Sustainable RE Investments: Navigating tradeoffs and synergies across Sectors and Borders»:** a «nexus criteria» for RE deployment
- (maybe) «nexus-proofed» RE investments possible candidates to become «Nexus Priority Interventions» to be developed into project concepts

..in the framework of GWP&UNECE project «Promoting the sustainable management of natural resources in SEE through the use of a Nexus Approach in SEE» (side-event)

Proposed nexus criteria for RE development (UNECE Guidance doc)

"not all RE projects are the same"

1) Maximizing synergies: opportunities for investing in RE while achieving cross-sectoral benefits

-> new financing models and partnerships?

2) Addressing trade-offs: a checklist for minimizing negative impacts and enhancing sustainability

-> effective implementation of legal instruments, guidelines and best social and environmental practices for infrastructural development

	Water	Agriculture, forestry, rural development	Environmental & Social	Transboundary
Hydropower	Multi-purpose dams • Enhanced flood control • Controlling access to water for different uses • Buffering low flows	Multi-purpose dams / small scale hydro • Access to irrigation Integration of micro hydro when renovating agricultural infrastructure	• Multi-purpose dams • Ensured environmental flows • Possibility to also capitalize on solar synergies by adding FPVs	Coordination of hydropower cascades
Bioenergy (biomass, biogas)	• Use of floodplains for biomass. • Biogas from wastewater treatment.	• Use of biomass from agricultural residues or forestry • Sustainable reforestation and forest management, in order to guarantee long-term resource planning and fuel supply. • Usage of byproducts (fertilizer, etc.)	• Beneficial use of waste • Decrease of indoor pollution due to cleaner fuels and technologies and move away from traditional biomass	Sustainable forestry as a means for flood protection
Wind and solar	Treatment of water from polluting industrial plants or other sources (?)	Renewable energy for productive uses (e.g. irrigation, pumping)	• Small scale projects for decentralized access (e.g. remote touristic • Replacement of technologies with higher environmental impacts. • Employment opportunities in new technologies.	

Proposed criteria	Current application of criteria	Applicability for:		
Environmental assessment		**Hydropower**	**Biomass**	**Wind/Solar**
EIA/SEA in a domestic context	• Capacity lacking in administration • Quality needs improvement			
EIA/SEA in a transboundary context	No			
Strategic assessment and planning				
Domestic inter-sectoral impact assessment of RE projects	Not assessed			
Transboundary inter-sectoral impact of RE projects	Not assessed			
Public participation and transparency				
Level of domestic public participation in new RE projects	Weak			
Level of transboundary public participation in new RE	No			

Group discussion

-> Pick 1 promising synergy (large scale or small scale)

1) Sectors involved/who benefits?

- agriculture/farmers, water/the water utility, industry/manufacturing etc.

2) How can it be financed?

- international, national, municipal, public, private, etc.

3) What needs to be done in order to implement it in Serbia?

- think about yesterday's discussion (e.g. community based projects, auctions..) & more broadly about inter-sectoral coordination issues/gaps

4) How to ensure sustainability of the investment?

- think about yesterday's discussion (e.g. public participation, transparency..) & find inspiration in the Discussion Paper's last table

Groups

3 groups, by RE technology:

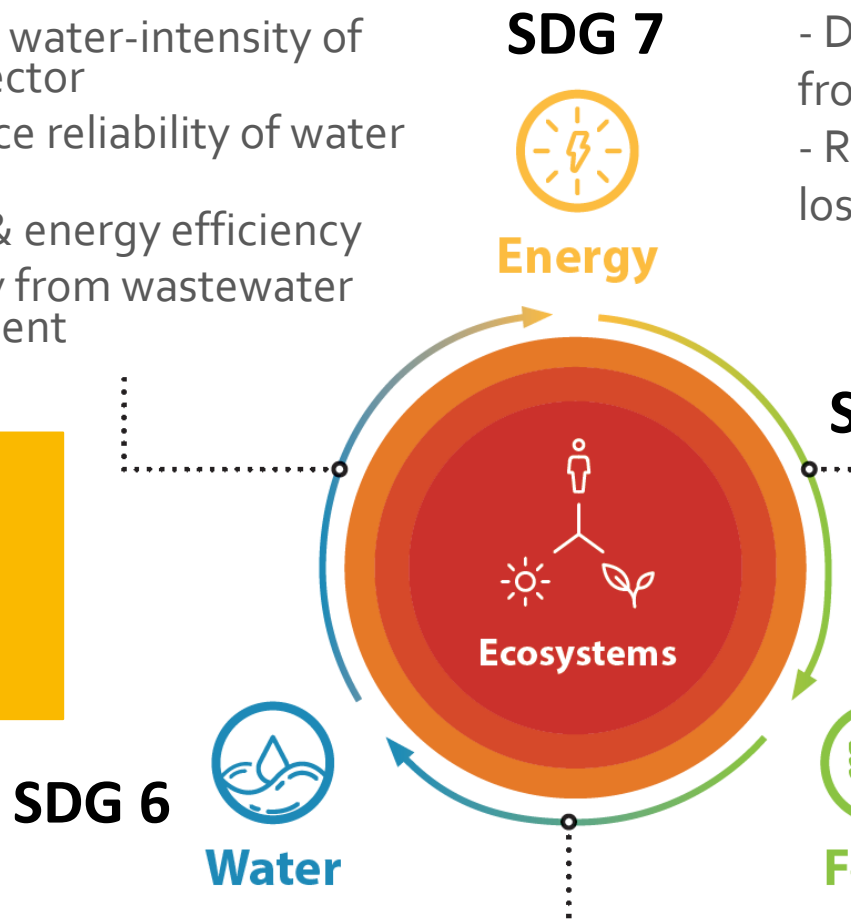
- Hydropower
- Bioenergy (incl. wood biomass)
- Solar/Wind

renewable energy & nexus

Decreasing cost of technology
-> RE a competitive option

Energy/water nexus
- Reduce water-intensity of power sector
- Enhance reliability of water supply
- Water & energy efficiency
- Energy from wastewater treatment

Energy/food nexus
- Decouple agrifood chain from fossil fuels
- Reduce post-harvest losses



SDG 13

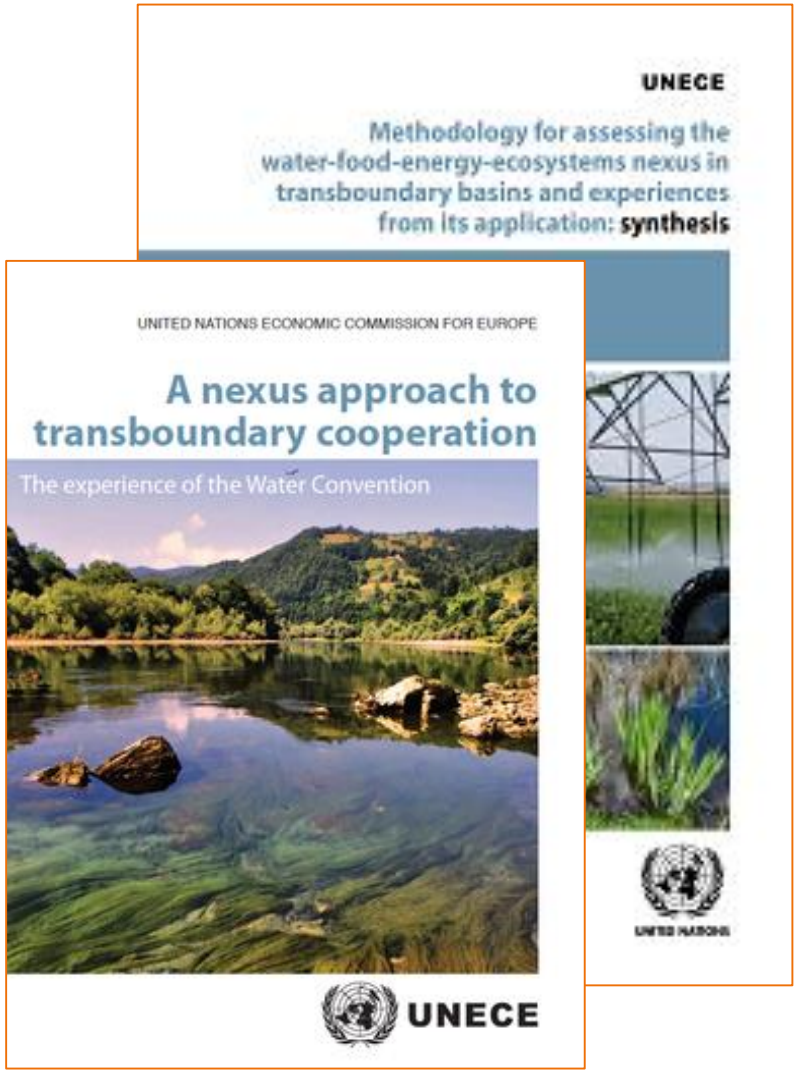
Energy/Climate
- Reduction of GHG emissions

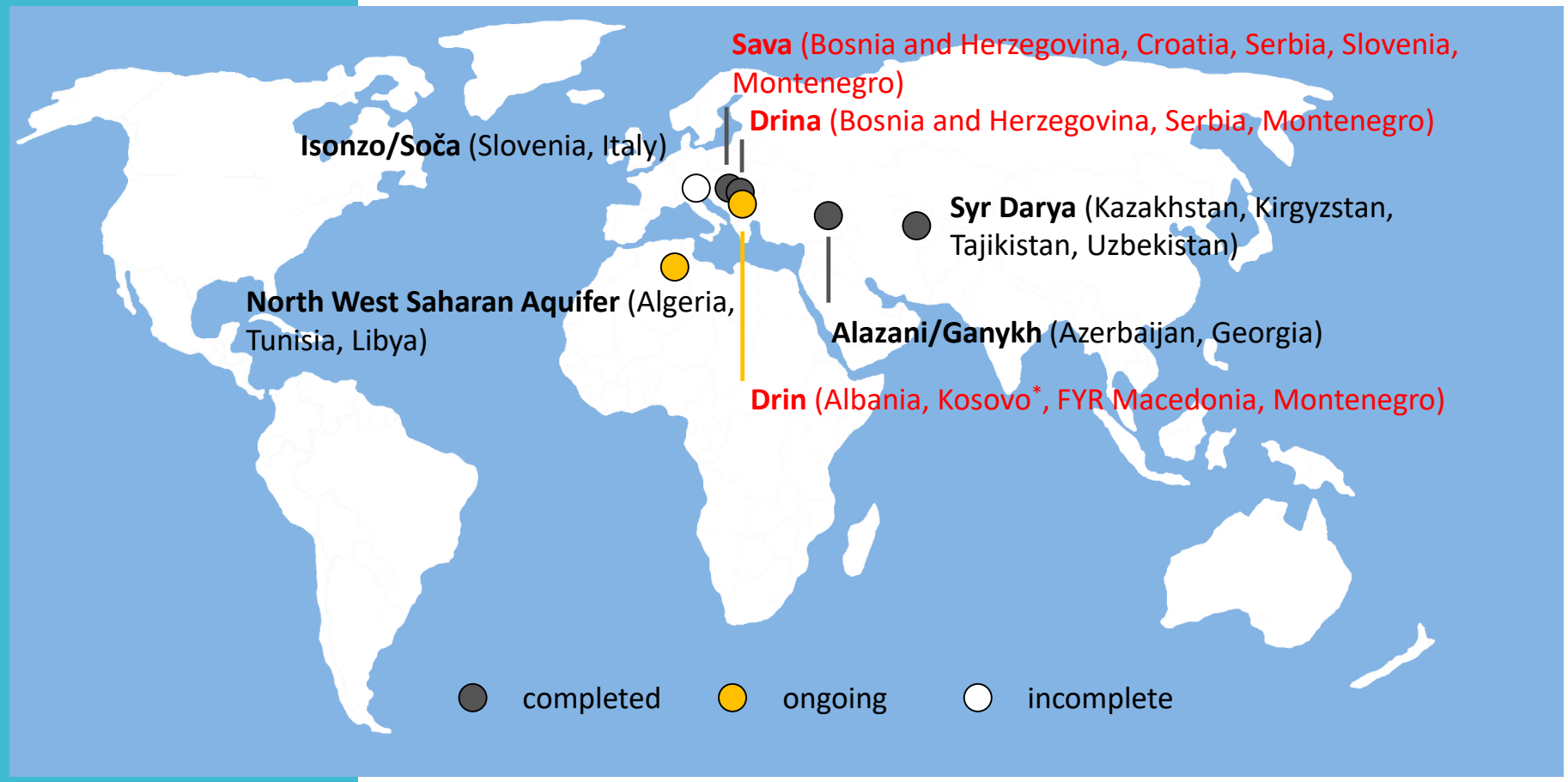
Water/food nexus
- Improve access to and sustainability of water supply for agriculture use

adapted from IRENA, 2015

Nexus work under the Water Convention of UNECE

- Strong **capacity building**, promoting practical addressing of the **transboundary nexus**
  - 5 meetings of the Water-Food-Energy-Ecosystems Nexus Task Force
  - 1 global stocktaking workshop (2016)
- 4 **nexus assessments completed**
- 2 **ongoing projects** in different stages of assessment
- Policy brochure on **renewable energy and nexus**
- Synthesis: **consolidated methodology** & **summary** published (2018)





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

Example of nexus dynamics – a river