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The Relationship between Water Sector Integrity and Requirements for Achieving Water, Food, and Energy Security

By

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Achieving the Sectoral Goals in a Dynamic World



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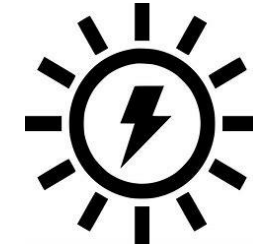
WATER

- By 2050, global water demand will increase by 55%
- By 2040, energy used in the water sector is projected to more than double.
- Irrigation is the largest volumetric producer of Wastewater



FOOD

- By 2050 global food production would need to increase by 60% to meet the food requirements
- 70% of global water usage is consumed by agriculture
- 30% of global energy consumption is used for food production and supply.



ENERGY

- Global power generation is forecasted to increase by almost 60% in the next ten years.
- 90% of global power generation is water intensive.
- Roughly 2,500 litres of water are required to produce 1 litre of liquid biofuel.

What is the WEF Nexus Approach

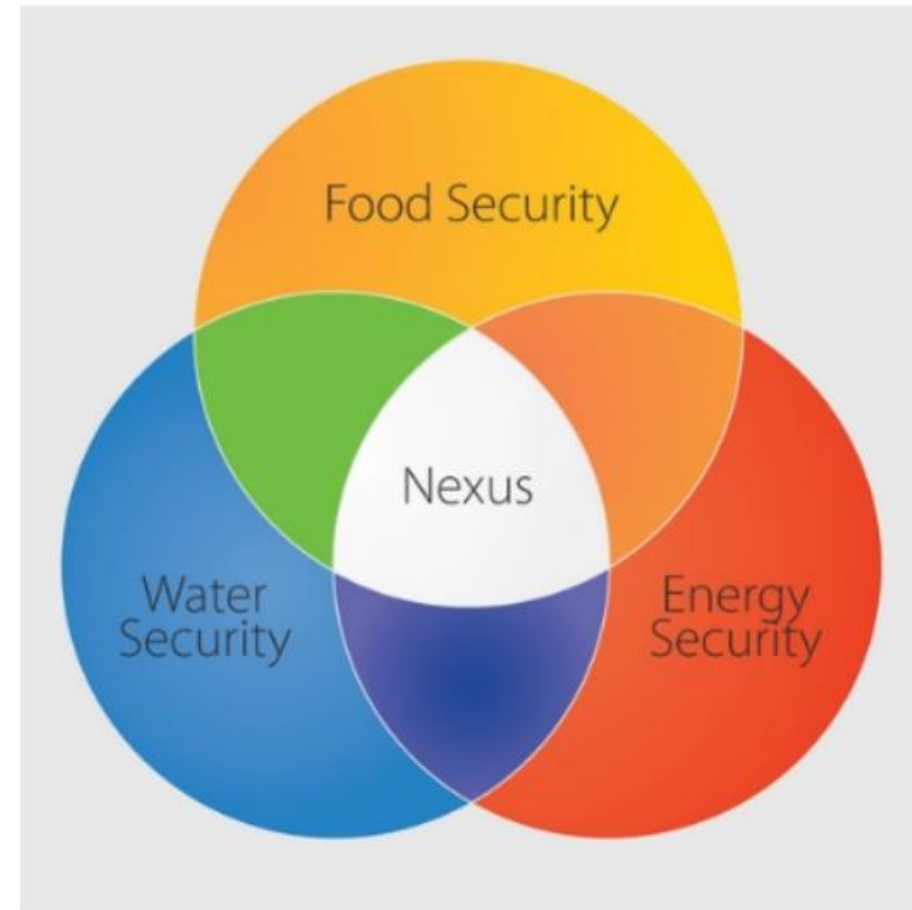
- Describes the complex and interrelated nature of our global resources systems
- Supports holistic resources management
- Pathways of sustainability through coordinated management and use of natural resources across sectors and scales



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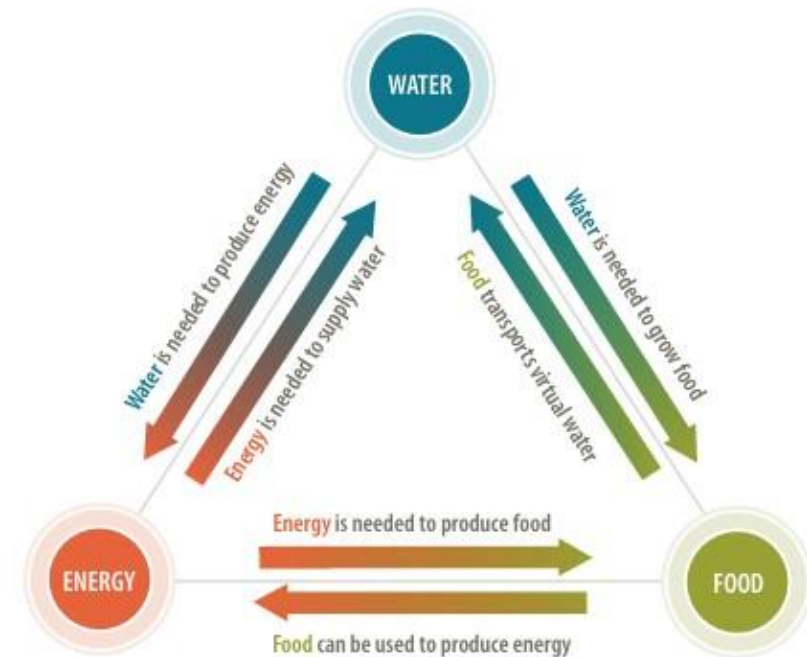


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Why Water-Energy-Food Nexus?

- Water, energy and food are essential for human well-being, poverty reduction and sustainable development
- Governments are often organized along sectoral lines, resulting in siloed management of environmental resources.
- Policy fragmentation remains a key challenge to overcome
- From a water-focused perspective, several factors have impacts on water resources that lie outside the strict domain of water management
- The interlinkages between water, energy and food have gained significant attention in recent years
- The Nexus approach can help reduce trade-offs and boost synergies between sectors, for greater policy coherence and better resource-use efficiency



SOURCE: UNU-FLORES

UNU-FLORES. The Nexus Approach (2018). Available at: <https://flores.unu.edu/en/research/nexus>



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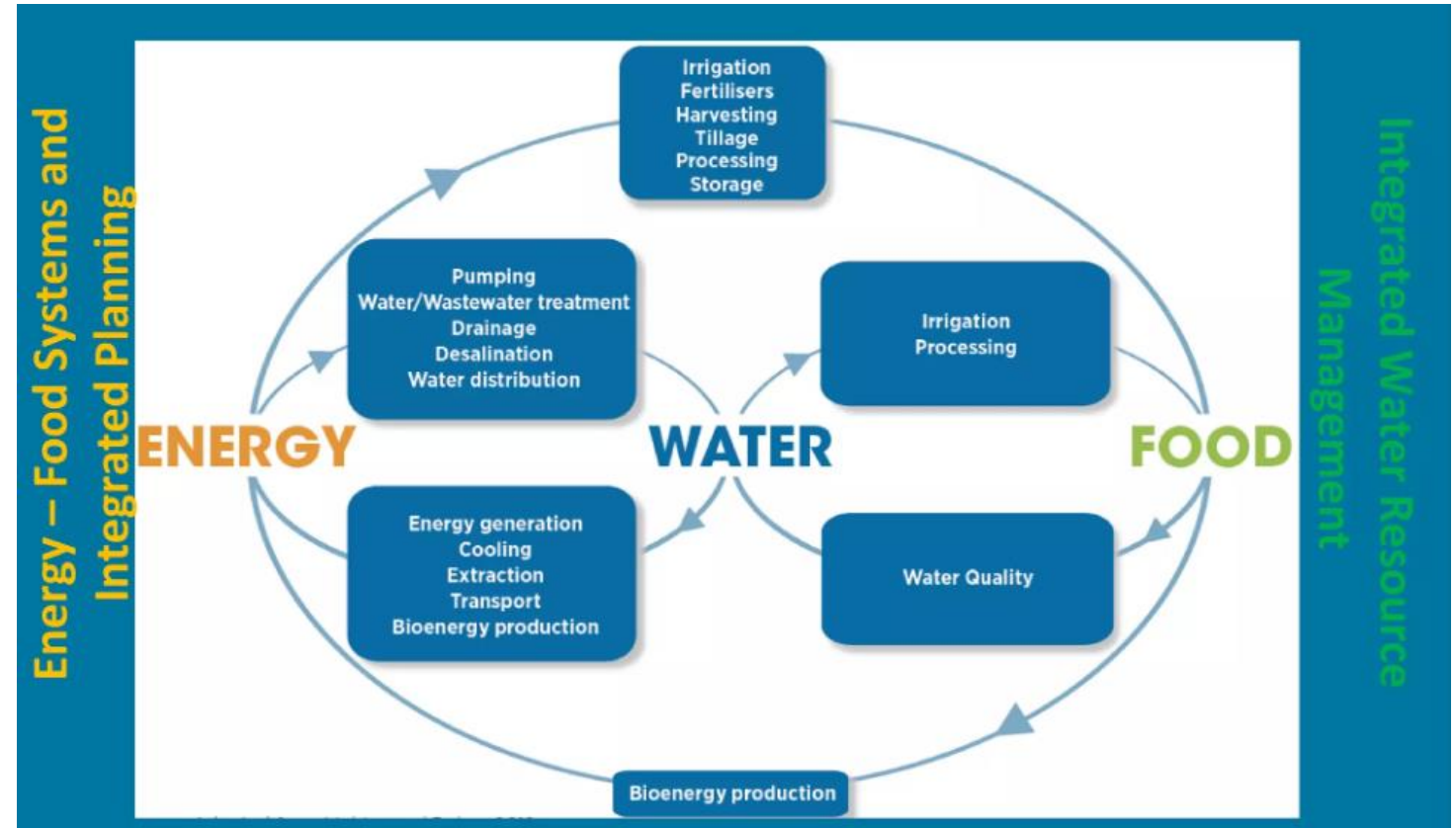


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Example of Interconnections

- Agriculture accounts for 70% of global fresh water withdrawal
- 90% of energy produced today is water intensive
- Agriculture and Food chain accounts for 33% of global energy consumption



Nexus Interlinkages Between SDGs for Water, Food, Energy, and Environment

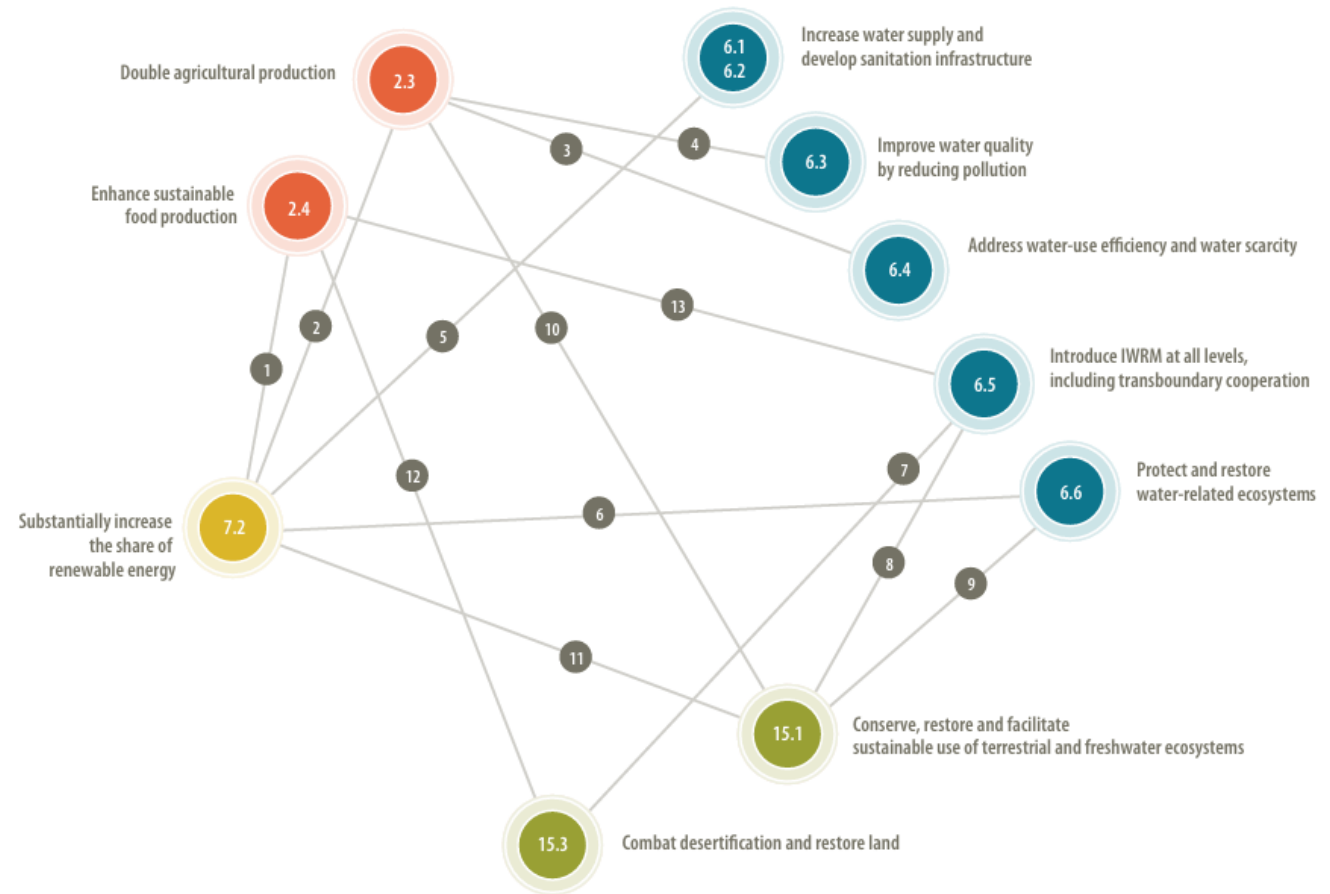
- The interlinked nature of the SDGs requires an implementation approach that is holistic, multisectoral and multidimensional
- The nexus concept is therefore well-positioned to inform actions and policies to support the achievement of SDGs



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SOURCE: Roidt, based on information from ICSU (2017) and UN-Water (2016)

Benefits of WEF Nexus



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- Contributes to achieving water, energy and food security as pillars of development and well-being
- Identifies and addresses trade-offs and reaches synergies between different sectors, thus improving decision making
- Creates mutual benefits of cooperation and improved resources governance
- Facilitates the alignment of development strategies
- Allows smart investments to be made
- Increase efficiency in resources use

Water Sector Integrity and WEF Nexus

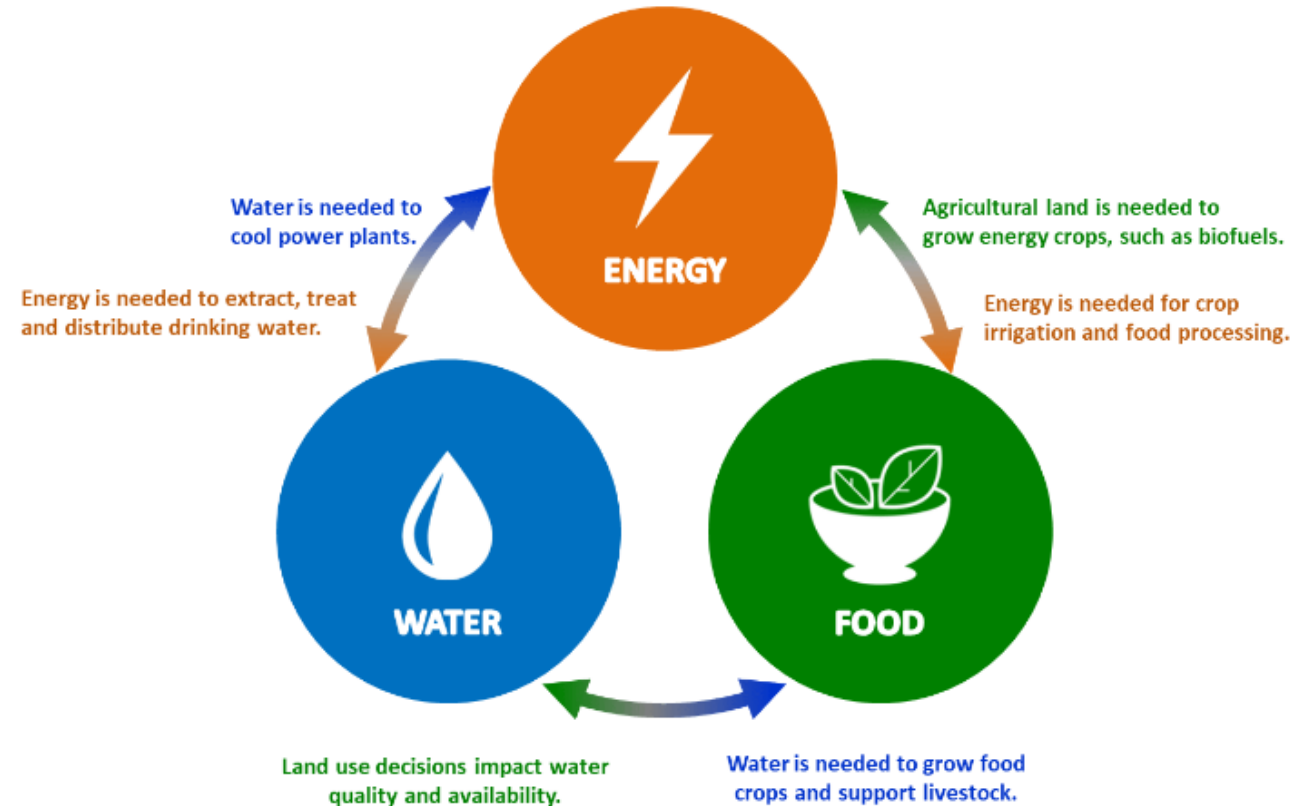
- Equitable and balanced weighting of the water, energy and agriculture sectors in decision-making processes
- Apply measures and instruments that:
 - Ensure an equitable and balanced consideration of all sectors,
 - Holding decision-makers accountable for their actions and decisions



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Leaving no one behind is a central principle of the WEF Nexus

- Specific consideration always needs to be given to population groups whose vulnerabilities are worsened by limited access
- In extreme events such as droughts, floods and famine, priority is given to human survival i.e. drinking water over irrigation



Strengthen cross-departmental and multi-sectoral cooperation

- Building an enabling environment to strengthen cross-departmental and multi sectoral cooperation and communication
- This will enhance mutual understanding and fosters trust and cooperation across sectors



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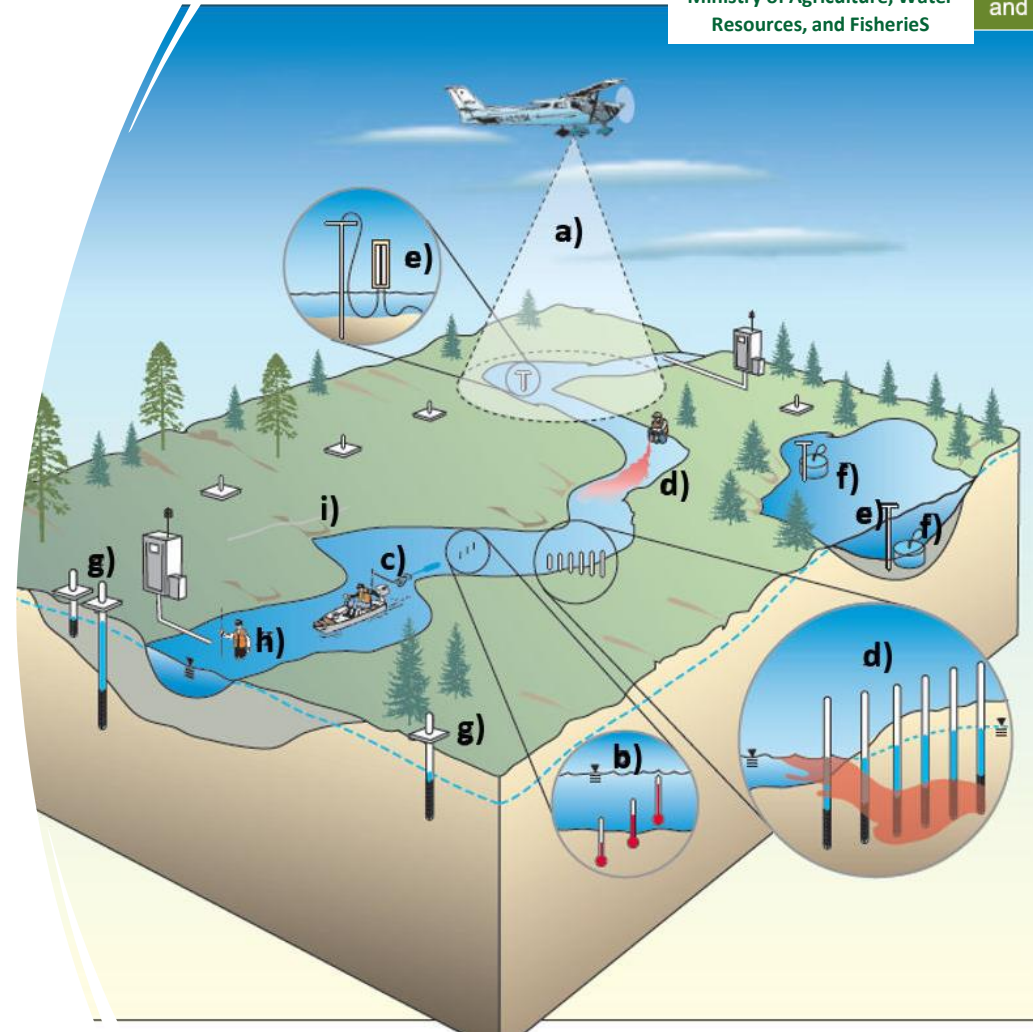


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Enhancing mechanisms for data exchange and modelling

- Quality, reliable and disaggregated data needs to be accessible and shared by relevant stakeholders
- To improve data reporting channels, harmonization and consistency



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Strategic Pointers for the UNDP Approach to Water

- **Contributing towards**
 - Achieving the 2030 Agenda for Sustainable Development
 - Realizing UNDP's Strategic Plan
- **By way of:**
 - **Integration:** Integrating social, economic, environmental dimensions of Sustainable Development
 - **Inclusion:** Meaningful participation of diverse stakeholders in strategic decision-making
 - **Governance Reform:** Setting the conditions for equitable and efficient management of water resources and services
- **Working with/thru:**
 - IWRM, relevant NEXUS areas, and ISSUE-based coalitions
 - Analysis and thought leadership: understanding the relevant context, and defining the problem before the solution

Water and Green Hydrogen Production

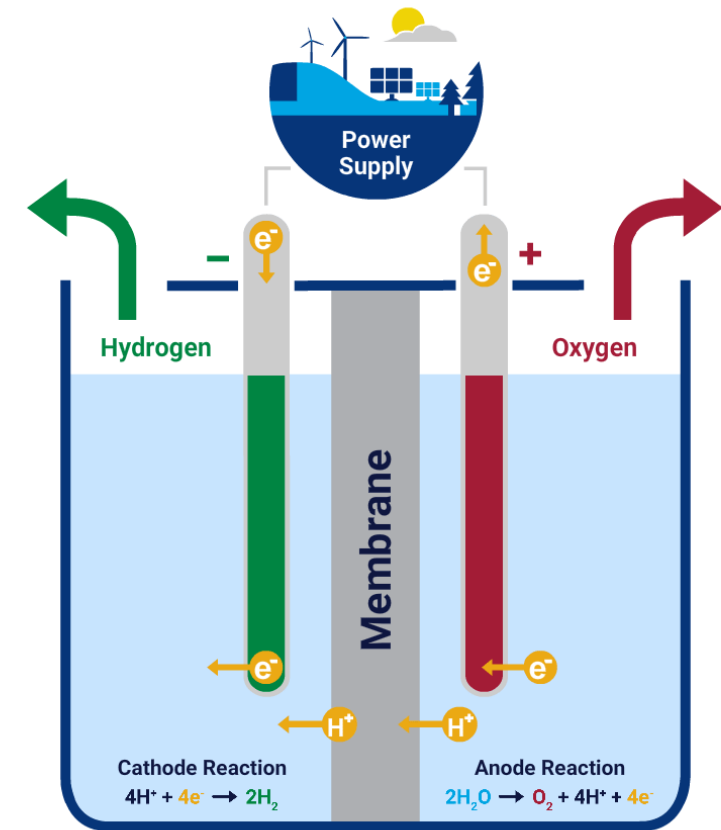
- Green hydrogen is produced through the process of electrolysis of water molecules
- hydrogen can store and deliver energy in a form that results in zero greenhouse gas emissions.
- It's critical to understand the amount of water required and how the water cycle is affected during the hydrogen production and usage phases
- one mole of water (about 18 milliliters) is required to produce one mole of hydrogen gas
- During electrolysis, water splits into hydrogen and oxygen. After hydrogen has been used as fuel, the only by-product is water, which is reintroduced into the environment
- The use of water must be managed carefully, especially in regions where water is already scarce



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Main Concluding Remarks



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- The **importance** of the WEF nexus is **rapidly increasing** because of the many effects that one element of the nexus may have on two others
- Successful implementation of the WEF nexus should focus on:
 - **Integration:** Integrating social, economic, environmental dimensions of Sustainable Development
 - **Inclusion:** Meaningful participation of diverse stakeholders in strategic decision-making
 - **Governance Reform:** Setting the conditions for equitable and efficient management of water resources and services
- Implementation of **IWRM principals** leads to a strong **enabling environment** for successful implementation of WEF Nexus
- The development and deployment of **green hydrogen** as an energy source should take into account regional **differences in water availability**



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Thank you

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