

United Nations Development Account Project on Developing the Capacity of ESCWA Member Countries
to address the Water and Energy Nexus for Achieving Sustainable Development Goals

Final Regional Policy Workshop on the Water-Energy Nexus

11- 12 December 2017, Beirut, Lebanon

Economic and Social Commission for Western Asia

Water-Energy Nexus Operational Toolkit: Technology Transfer



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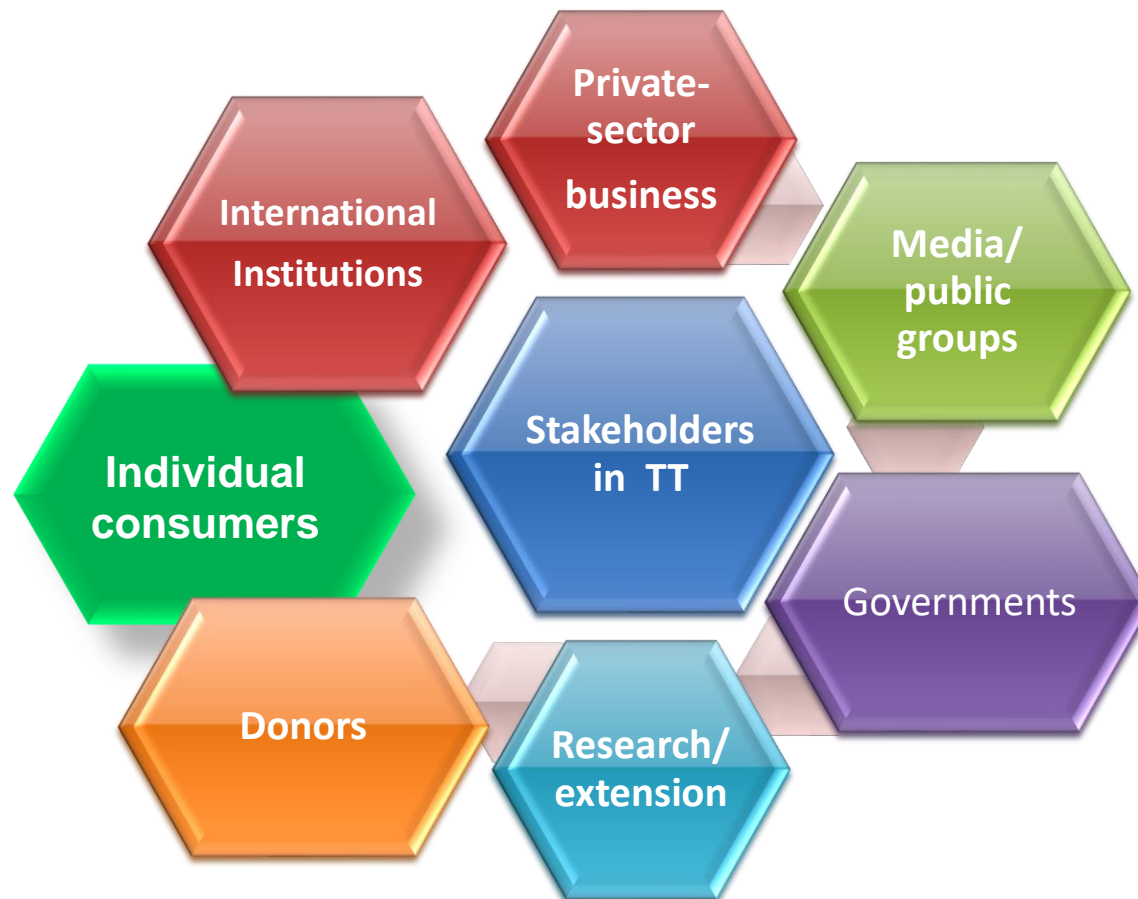
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Technology transfer (TT) is the “broad set of processes covering the flows of **know-how**, **experience** and **equipment**, and is the result of many **day-to-day** decisions of the different **stakeholders** involved”.



Stakeholders involved in TT

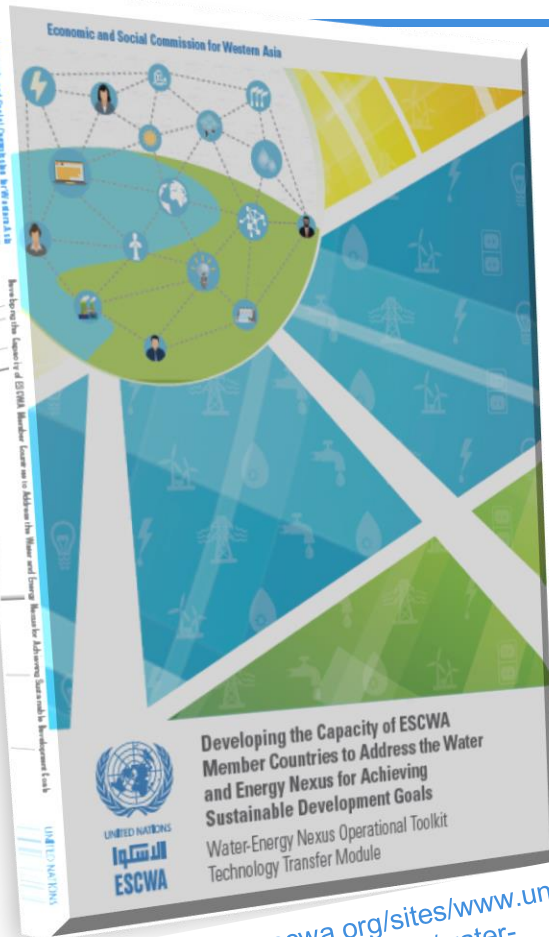


TT provides a means through which the SDGs can be achieved

Technology as a mean of implementation of the 2030 Sustainable Development Agenda and Paris Agreement for Climate Change



Water-Energy Nexus Operational Toolkit Technology Transfer Module



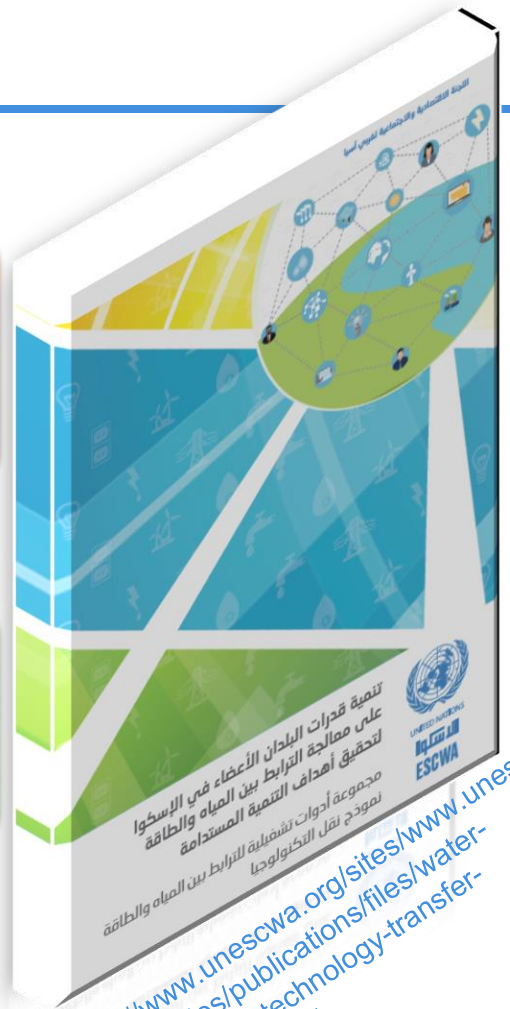
https://www.unescwa.org/sites/www.unescwa.org/files/publications/files/water-energy-nexus-technology-transfer-module-english_0.pdf

Technology Transfer Principles

Technologies for energy efficiency

Technologies for water efficiency

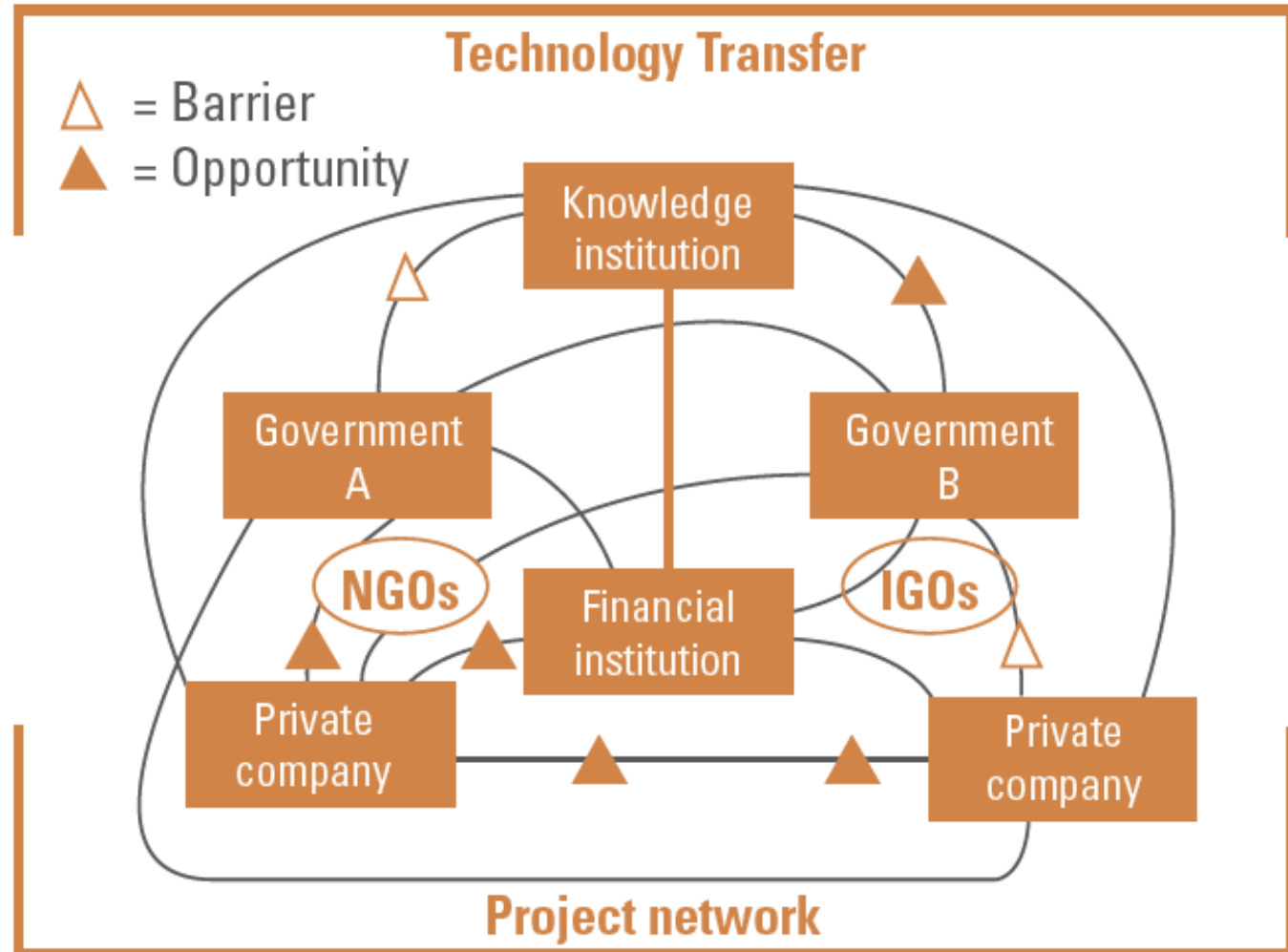
Renewable energy technologies



<https://www.unescwa.org/sites/www.unescwa.org/files/publications/files/water-energy-nexus-technology-transfer-module-arabic.pdf>

Technology Transfer System

TT is an integral part of increasing innovation in an economy to achieve economic development.



Intuitive institutional models in Arab countries

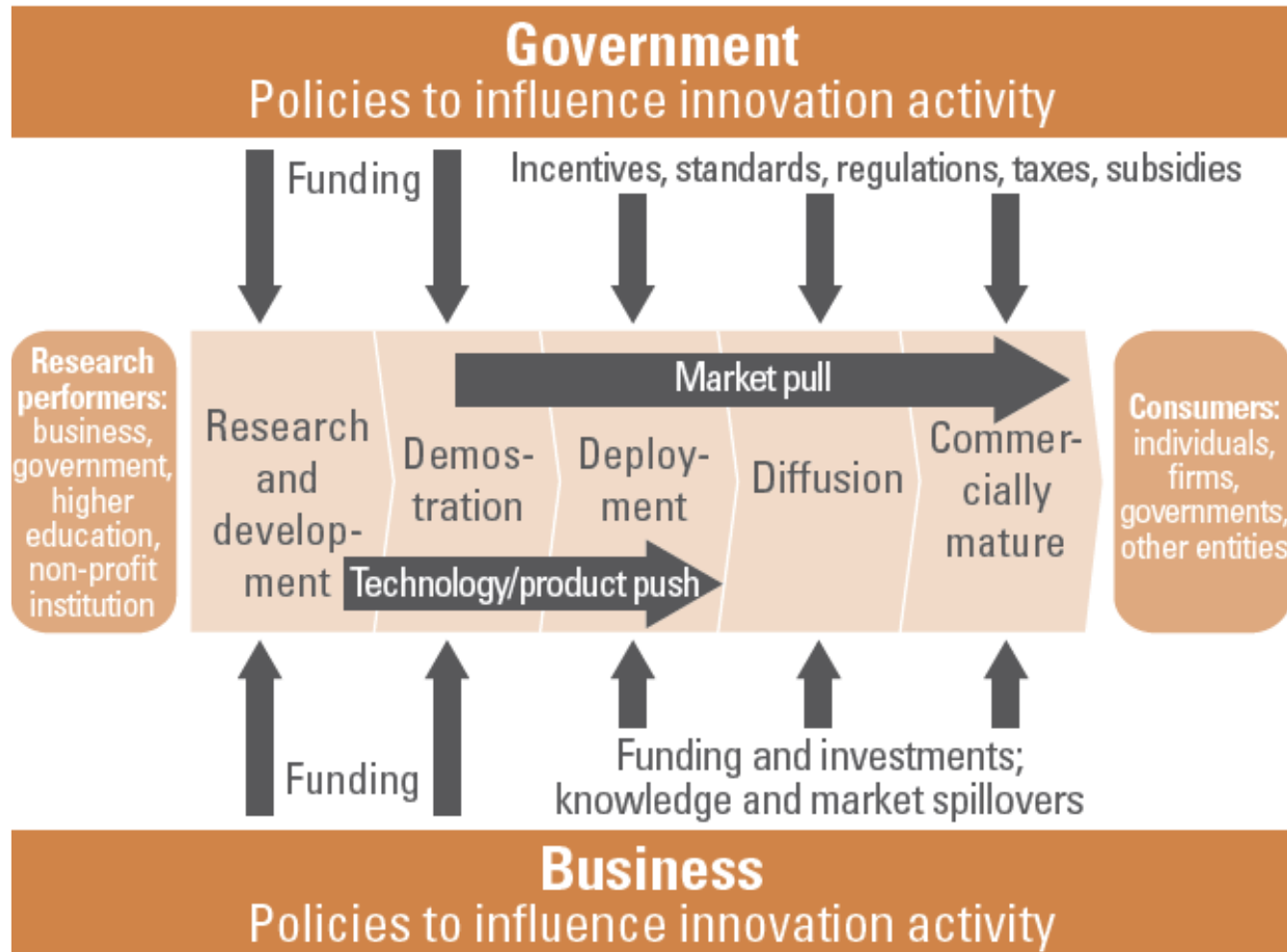
Type	Countries	Main Features
The Gulf model	Gulf countries	Decentralized trade-oriented governance Public universities open to foreign teachers/researchers Research based on international collaborations Foundations for research
The Middle East model	Syria Egypt Iraq	Centralized type of governance Research in large public research centers and universities, as well as in international and private universities. Large public universities
The Mashreq model	Lebanon Jordan	Decentralized governance Research concentrated in private universities
The Maghreb model	Algeria Morocco Tunisia	Centralized governance Large public universities Research mainly in universities and public research institutes

Assessment of TT framework options for the water-energy nexus

1. Potential for large-scale resource efficiency improvement and RE deployment worldwide
2. Relevance and flexibility regarding needs of countries at different development stages
3. Effectiveness across sectors and consistency with sectoral strategies
4. Ability to mobilize and leverage private investment
5. Potential to be self-sustaining and replicated
6. Cost-effectiveness
7. Ease of implementation
8. Effective governance structure to inspire trust and cooperation
9. Advancement of use of indigenous technologies
10. Sustainability
11. Ability to monitor, report and verify

The innovation process

Successful TT requires a certain environment which is only possible with the support and cooperation of local governments.



Policy tools and frameworks to facilitate TT

1. National systems of innovation and technology infrastructure	Build the capacity of firms for innovation Develop scientific and technical educational institutions
2. Social infrastructure and recognition through participatory approaches	Increase the capacity of social organizations and NGOs, create new private-sector focused social organizations
3. Human and institutional capacities	Build capacities of firms, NGOs, regulatory agencies, financial institutions and consumers
4. Macroeconomic policy frameworks	Exp: Raise energy tariffs to cover LT economic costs, Reform financial sector regulation, financial support
5. Sustainable markets for environmentally sound technologies	Conduct market transformation programs focusing on technology supply and demand Develop capacity for technology adaptation by SMEs
6. National legal institutions	Strengthen national IP protection frameworks, administrative, legal institutions to reduce risks
7. Codes, standards and certification	Develop certification procedures and institutions, including test and measurement facilities, codes and standards
8. Equity considerations	Devise analytical tools and provide training for social impact assessment before technology is selected
9. Rights to productive resources	Investigate impact of technology on property rights, and test it through participatory approach
10. Research and technology development	Develop science and educational infrastructure, Invest directly in R&D

TT within the context water-energy nexus in the Arab Region

- **There are many ways in which the Arab countries can implement more effective and sustainable TT:**
 - Programs can be designed to address the complete TT chain.
 - Requiring large businesses to contribute towards local research funds.
 - More transparency and Data reporting to be adopted throughout the TT process.
 - Collaboration must be facilitated between entities in different countries and within the same country which are working in the same area.
- **There are also many different technologies available:**
 - Local authorities must carry out the required due diligence to ensure that the technological option chosen is suitable for the intended region of use or the technology must be modified to take local conditions into consideration.
- **Frequently the required technology is already being used in other countries; the TT to the Arab countries must be facilitated.**
 - E.g., the market for RE components would grow providing support for the local manufacturing of these components.
- **Some Arab countries are stronger than others when it comes to TT.**
 - The stronger countries assisting the weaker ones would be positive for the whole region.

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YEARS