

**TECHNOLOGY**  
FACILITATION MECHANISM



**SUSTAINABLE  
DEVELOPMENT GOALS**

## ***Current Approaches to STI Policy Making in the Context of SDGs***

### **2<sup>nd</sup> session**



#### **Clovis Freire**

Economic Affairs Officer  
Science, Technology and ICT Branch  
Division on Technology and Logistics  
UNCTAD  
freire@un.org

## **Designing Technology and Innovation Policy Instruments**



#### **Kornelia Tzinova**

Assistant Program Specialist for Science  
Policy and Partnerships

United Nations  
Educational, Scientific and  
Cultural Organization

# WHAT ARE POLICY INSTRUMENTS?

- ❑ STI Policy sets the direction of scientific production, technological learning and innovation (Policy objectives)
  - ✓ More jobs, green growth, reduce poverty, gender equality, etc..
- ❑ STI Policy instruments are the **tools** used to shape **economic activities** and **institutions** to reach the goals set by the STI Policy
  - ✓ Shape through promoting innovation
  - ✓ Funded or initiated by the public sector
  - ✓ Programmes, incentives, initiatives, rules, etc..
  - ✓ Policy mix, policy portfolio
  - ✓ Creative destruction (structural transformation)





# What types of tools?

---

- Sectoral
  - the benefits go to a specific knowledge discipline, technological area, productive sector or a specific issue;
- Horizontal
  - the benefits go to all the disciplines, areas and sectors





# What types of tools?

## By target group within NIS

---

- Private sector
  - Stimulate innovation in existing innovative firms
  - Enlarge the base of innovative firms
  - Attract innovative firms from abroad
  - Promote new firms within existing sectors
  - Promote new sectors
- Financial sector
  - Increase capacity to finance innovation
- Civil society
  - Increase social innovation
- Public sector
  - Increase innovation in the public sector
- Academia and research
  - Increase scientific capacity
  - Increase technological learning



## What types of tools? By type of innovation

- Product innovation
  - New goods and services
  - Improved goods and services
  - New to the world, new to the country, new to the firm
- Process innovation
  - Improved processes in the production of goods and services
  - Technology, business models
- Institutional innovation



# What types of tools?

## By Supply or demand

- Supply
  - Technological and innovation capacities
  - Finance
  - Infrastructure
  - Supply chain approach
- Demand
  - Finance, tax and subsidies
  - Awareness programmes





## What types of tools? By level of intervention

- Supply side
  - Incentives (tax, subsidies)
  - Provide infrastructure
  - Coordinate action
  - Creation of the production
- Demand side
  - Information (labels, certifications)
  - Incentives (tax, incentives)
  - Direct procurement

Photo by [H Shaw](#) on [Unsplash](#)

# What types of tools? By actions areas

	Policy instruments	How can they support innovation for sustainable development?
Regional innovation strategy & networks	Clusters, industrial zones, and science and technology parks	Encourages smart specialization in innovation and technological areas relevant for societal challenges in regions with high potential and/or need for goods and services with environmental and social benefits
	Technology platforms and networks	Promotes information and knowledge sharing on innovation
	Roadmaps and technology foresight	Creates shared vision, commitments and roadmaps for experimentation, investment and development of eco-innovation, “wires up” the innovation system
Capacity building and information provision	Business advisory services	Promotes skills and knowledge relevant for innovation
	Local entrepreneurship and business incubation	Promotes local entrepreneurship and local innovation
	Technology transfer and matching	Promotes identification and transfer of innovative technologies relevant for tackling specific challenges
	Capacity building for governments	Promotes building up government capacity to design, implement, coordinate and evaluate STI policy with a view of its support for sustainable development
	Market intelligence services	Promotes information, data and knowledge sharing on innovation trends related to sustainable development (reduces information asymmetry)
Information and cultural Instruments	Education and awareness raising	Campaigns or programmes can ‘popularise’ science, technology and innovation and – if appropriately designed – enhance democratic inputs to innovation policy
	Network facilitation and enhancement	Aids lesson learning and sharing e.g. events such as Fuck-up Nights, Start-up weekends etc
	Virtual and material infrastructure/ events for innovation network-building	Hackathons, maker spaces, transformation labs



# What types of tools? By action areas

	Policy instruments	How can they support innovation for sustainable development?
Economic instruments	R&D funding	Provides direct support for R&D underpinning sustainable innovation
	Innovation funding for companies	Provides direct support for innovation activities aiming in the areas relevant for sustainable development
	Equity support to venture & seed capital	Provides equity dedicated to innovation; de-risks innovation investments
	Feed-in-tariffs and similar subsidy schemes	Provides financial incentives to adopt and diffuse innovative technologies in selected technology areas (e.g. renewable energy)
	Tradable permit systems (e.g. emissions trading)	Allocates or sells emission rights to polluters which can be traded. The price for emission rights and prospect of reduction of emission rights creates incentives for innovation
	Removal of subsidies for unsustainable activities	Removes distortion from markets that inhibits sustainable innovation (e.g. subsidies for fossil fuels)
Fiscal instruments	Tax incentives for R&D for companies	Tax reduction (CIT) for companies undertaking R&D underpinning innovation
	Tax incentives for technology adopters	Tax reduction (CIT) for companies adopting innovations with environmental and social benefits
	Environmental taxation	Tax reduction (CIT) for companies undertaking R&D underpinning innovation
	Removal of tax reliefs for unsustainable activities	Removes distortion from markets that inhibits sustainable innovation (e.g. subsidies for fossil fuels)
Trade policy	Trade tariffs	Removes barriers to trade in innovative goods and services which contribute to the SDGs; opens access to knowledge important for adoption and diffusion of technology; also imposes barriers on environmentally and socially harmful goods and services

# What types of tools? By action areas


	Policy instruments	How can they support innovation for sustainable development?
Demand support	Sustainable public procurement	Creates markets for goods and services with positive impacts on the local community in the areas relevant for sustainable development (e.g. Green Public Procurement)
	Pre-commercial procurement (R&D and innovation procurement)	Creates markets for innovative goods and services and stimulates experimentation of new application of emerging technologies
	Support to private demand	Provides incentives (e.g. vouchers) for consumers to purchase innovative goods and services with demonstrated positive social and environmental impacts
Education & training	Adaptation of formal education curricula to address the SDGs	Adapting higher education and vocational training curricula to consider sustainable development challenges. The curricula may be developed jointly with industry and other organizations. Provides qualified and skilled workforce
	Placement schemes and staff mobility	Supports learning, knowledge exchange and connections between actors in the innovation system with a focus on actors active in promoting sustainable innovation.



# What types of tools? By action areas

	Policy instruments	How can they support innovation for sustainable development?
Regulatory framework	Environmental and health protection regulations	Provide incentives to innovate to comply with regulatory framework (e.g. substitution of harmful chemicals). Provides disincentives for free riders by introducing penalties.
	Product and industrial process standardization	Provide incentives to innovate to comply with environmental and social performance standards for products and processes
	Consumer protection, labels and certification	Promotes innovative products and processes by providing information on environmental and social performance of products and services to customers
	Intellectual property rights	Encourages firms to engage in innovation activity by protecting their knowledge; and opens access to knowledge and technologies contributing to sustainable development
	Competition Law	Prevents the emergence of monopolies or cartels that can stifle innovation and hold back its benefits for consumers or the environment
	Bankruptcy Law	Can help to engender a risk-taking, entrepreneurial culture, protecting investors, firms and consumers against some of the negative effects of failure

# Country Examples of Policy Instruments and Objectives

	<b>PROPYME Fund:</b> Promote and improve management and competitiveness of Costa Rican Small and Medium Enterprises (SME), through technological and scientific development
<b>COSTA RICA</b>	
	<b>National Research Fund:</b> Strengthening the production of new scientific knowledge.
<b>GHANA</b>	
	<b>Innovative techno-parks:</b> Development of strategic technological areas and new niche products and services. Promotion and development of innovation in the production of goods and services.
<b>UZBEKISTAN</b>	

## Leaders in Innovation Fellowship Programme:

Strengthening the social appropriation of scientific knowledge and new technologies. Recognize, tap, nurture and reward ST&I talent through compensations and royalties.

## Enterprise Support for the Private Sector – KFAS:

Help companies develop their core business using science, technology and innovation

## Sectoral Fund for Research and Technological Development in Energy-CFE:

Strengthening the production of new scientific knowledge.  
Sectoral approach of the instrument.

## iSME Programme:

Development of strategic technological areas and new niche products and services with high- added value. Promotion and development of innovation in the production of goods and services. Promotion of start-ups in areas of high technology.



**Kenya**



**Kuwait**



**Mexico**



**Lebanon**



# Example of policy Instrument

## Instrument: Technological Development

Grants towards the implementation of the **Technological Development Projects (TDP)** leading to generate innovation of products and processes, presented by SMEs seeking to increase competitiveness by incorporating technology through:

- Technology development and pilot-scale prototypes.
- Production of knowledge relevant to a technological solution, the development achieves a laboratory scale or equivalent.
- Development of new processes and innovative products.
- Adaptation or technological changes in production processes, which involve significant engineering efforts.

Type

Goal

Why-> Issue to tackle  
expected outcome

How-> strategies to  
achieve results

Who -> Beneficiaries

What -> activities  
outputs

Competitive or  
accessible to all?

Source of funding

Timeframe

# Policy Instruments Analyzed by SDGs

Country	1 NO POVERTY	2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	4 QUALITY EDUCATION	5 GENDER EQUALITY	6 CLEAN WATER AND SANITATION	7 AFFORDABLE AND CLEAN ENERGY	8 DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	10 REDUCED INEQUALITIES	11 SUSTAINABLE CITIES AND COMMUNITIES	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	13 CLIMATE ACTION	14 LIFE BELOW WATER	15 LIFE ON LAND	16 PEACE, JUSTICE AND STRONG INSTITUTIONS	17 PARTNERSHIPS FOR THE GOALS
Botswana	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Costa Rica	-	-	-	-	1	1	-	9	11	-	-	-	-	-	-	-	1
Egypt	-	-	-	-	-	-	-	4	11	-	-	-	-	-	-	-	1
Ethiopia	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
Gambia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ghana	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-
India	2	1	5	2	2	2	6	13	24	-	1	-	1	-	-	-	2
Jordan	-	-	-	-	-	-	-	7	7	-	-	-	-	-	-	-	1
Kenya	-	-	-	3	-	-	-	-	8	-	-	-	-	-	-	-	2
Kuwait	-	4	4	2	-	4	4	4	15	-	-	-	-	-	2	-	4
Lebanon	-	-	-	1	-	-	-	9	12	-	-	-	-	-	-	-	3
Mexico	1	1	-	1	2	1	2	3	11	1	3	1	-	1	-	-	3
Mozambique	8	3	1	5	-	1	-	5	16	-	-	1	-	-	-	-	4
Panama	-	1	-	1	-	1	-	4	4	-	-	-	-	-	-	-	-
Peru	-	-	1	-	1	1	-	18	16	-	-	-	-	1	-	-	-
Sudan	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-
Tunisia	-	-	-	-	-	-	-	17	21	-	-	-	-	-	-	-	1
Uganda	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	3
United Arab Emirates	-	-	-	-	-	-	-	3	4	-	-	-	-	-	-	-	-
Uzbekistan	-	-	-	-	-	-	-	2	4	-	-	-	-	-	-	-	1

Source:  
GO-SPIN  
Platform





# Design of policy instrument mix

- 1) What are the goals? Set priorities & identify interlinkages
- 2) What is the current situation of the NIS and existing policy instruments?
- 3) What are the economic sectors and institutions that need to be shaped to reach the goals?
- 4) What are the key actors of the NIS involved in these sectors and activities?
- 5) What are the supply and demand factors that need to be changed?
- 6) What is the level of intervention in the supply and demand sides?
- 7) Who are responsible for the policy instruments?



# Why is it complex?

---

- Systemic nature of the objectives (SDGSs)
- Diversity of actors
- Diverse policy instruments
  - STI policy instruments (by STI ministries and other Ministries)
  - Other policy instruments that affect innovation unintentionally
- Policy mix
  - Intentional (e.g. clusters)
  - Co-evolution





# Key principles

---

- Directionality (tools for a purpose)
- Participatory process of policy instrument design
- Major role: coordinate the implementation
- Open to experimentation
- Monitoring and evaluation is key
- Continuous process

# ***Current Approaches to STI Policy Making in the Context of SDGs***



## **Clovis Freire**

Economic Affairs Officer  
Science, Technology and ICT Branch  
Division on Technology and Logistics  
UNCTAD  
[freire@un.org](mailto:freire@un.org)



United Nations  
Educational, Scientific and  
Cultural Organization

## **Kornelia Tzinova**

Assistant Program Specialist for Science  
Policy and Partnerships