

# HARNESSING RAPID TECHNOLOGICAL CHANGE FOR INCLUSIVE AND SUSTAINABLE DEVELOPMENT

2019-2020 CSTD Intersessional Panel  
7-8 November 2019



# AGENDA

**TECHNOLOGICAL CHANGE & INEQUALITIES**

**INCLUSIVE & SUSTAINABLE BUSINESS MODELS**

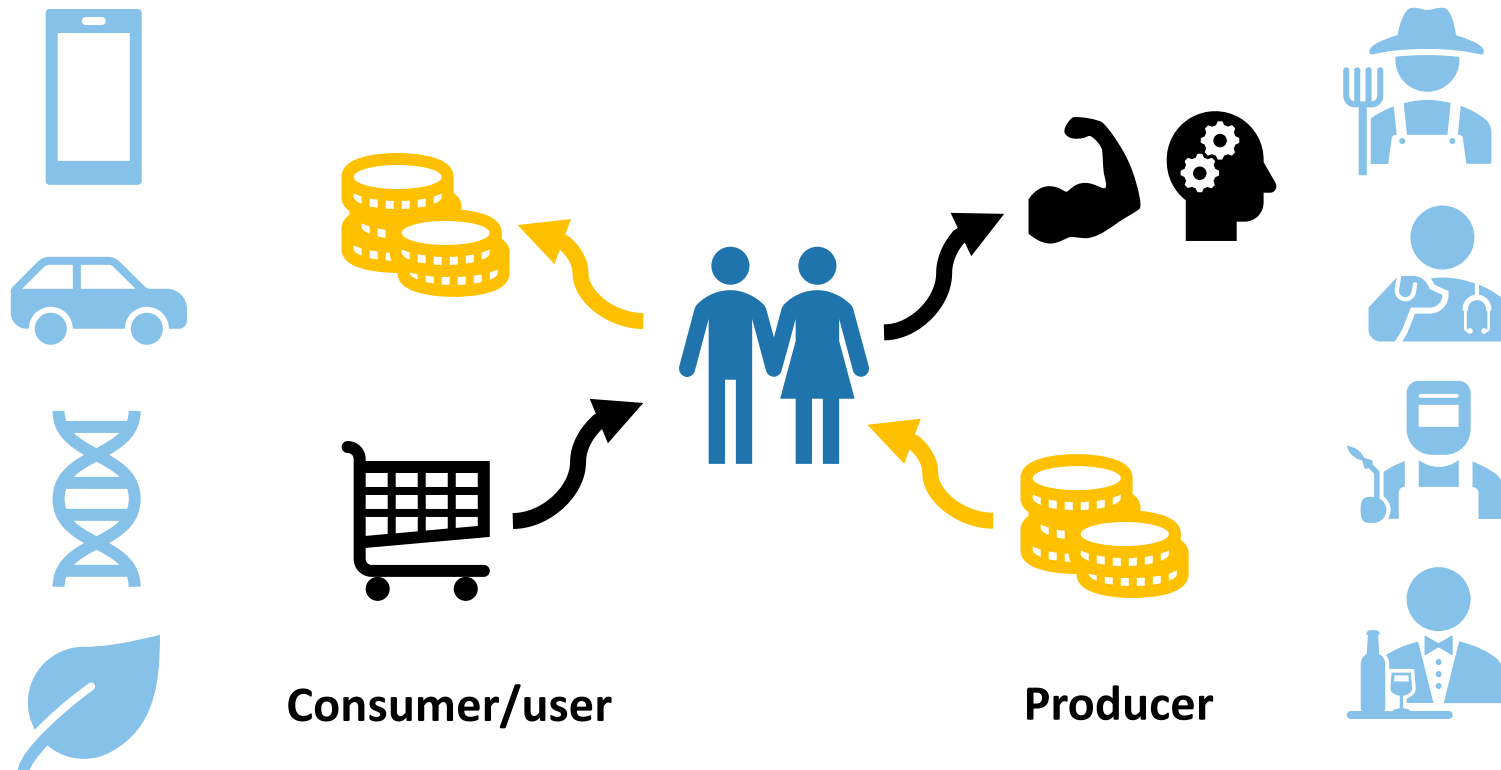
**THE ROLE OF STI POLICIES**

**INTERNATIONAL COLLABORATION**

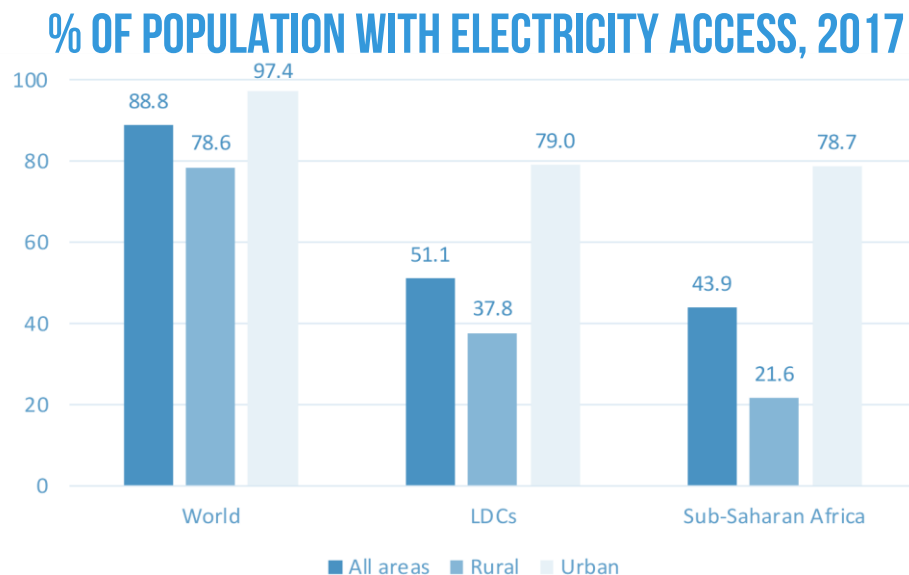
**POLICY CONSIDERATIONS**



# TECHNOLOGICAL CHANGE AND INEQUALITIES



# Unequal access to new technologies reflects and could perpetuate existing divides



## ACCESS TO ESSENTIAL TECHNOLOGICAL SUPPORT INFRASTRUCTURE:

DESPITE THE PROGRESS, LARGE DIVIDES REMAIN IN ACCESS TO ELECTRICITY AND CONNECTIVITY

- Existing inequalities must be addressed head-on and in the first place
- Governments and other stakeholders should continue striving to **reach universal electrification** and to **close digital divides**
- All stakeholders should also continue to **fight all forms of social biases and discriminations**
- Governments should explore ways to **increase the coverage of new goods and services that use frontier technologies and address the SDGs**, including by providing these goods and services as public services (e.g. AI-based solutions in medicine introduced in Latvia)

# The way that technology is designed and used can also perpetuate and increase inequalities

- Default female voice of AI digital assistants: Perpetuate gender stereotypes
- Technology built with men in mind: Reduce the benefit of products and services for women
- AI developed to assist decision making: Biased data can replicate inequalities
- Digitalization of welfare services: Punish those that do not have digital access and skills
- The international community: **Raise the awareness of the private sector of the unintended consequences** of new goods and services that use some of these frontier technologies
- Companies: **Build their capacity to identify potential negative effects** and establish mechanisms to improve their R&D processes to avoid biased design
- All stakeholders: develop mechanisms to ensure that **data** used for training AI applications are **free from biases and discriminations**



# Labour markets

- AI and robots threaten to substitute workers performing routine tasks
- Gig economy
- Services globally tradeable

- Government and other stakeholders should **ensure a smoother transition period** and that those who lose their jobs are able to find decent alternative livelihood paths
- They should pay attention to **retraining, life-long learning, and employment support** mechanisms that could address the risk of technological unemployment

# Market concentration

- Winners take all & market concentration
- Technology products bundled with other products and services
- But innovation promotion can prevent this inequality due to market concentration from being perpetuated
- Governments and other stakeholders could support innovation by creating programmes and mechanisms to **disseminate the application of frontier technologies and the examples of successful business models**
- There is also a role for **competition policy** to reduce the potential negative effects of excessive market power of leading technology firms on further innovation

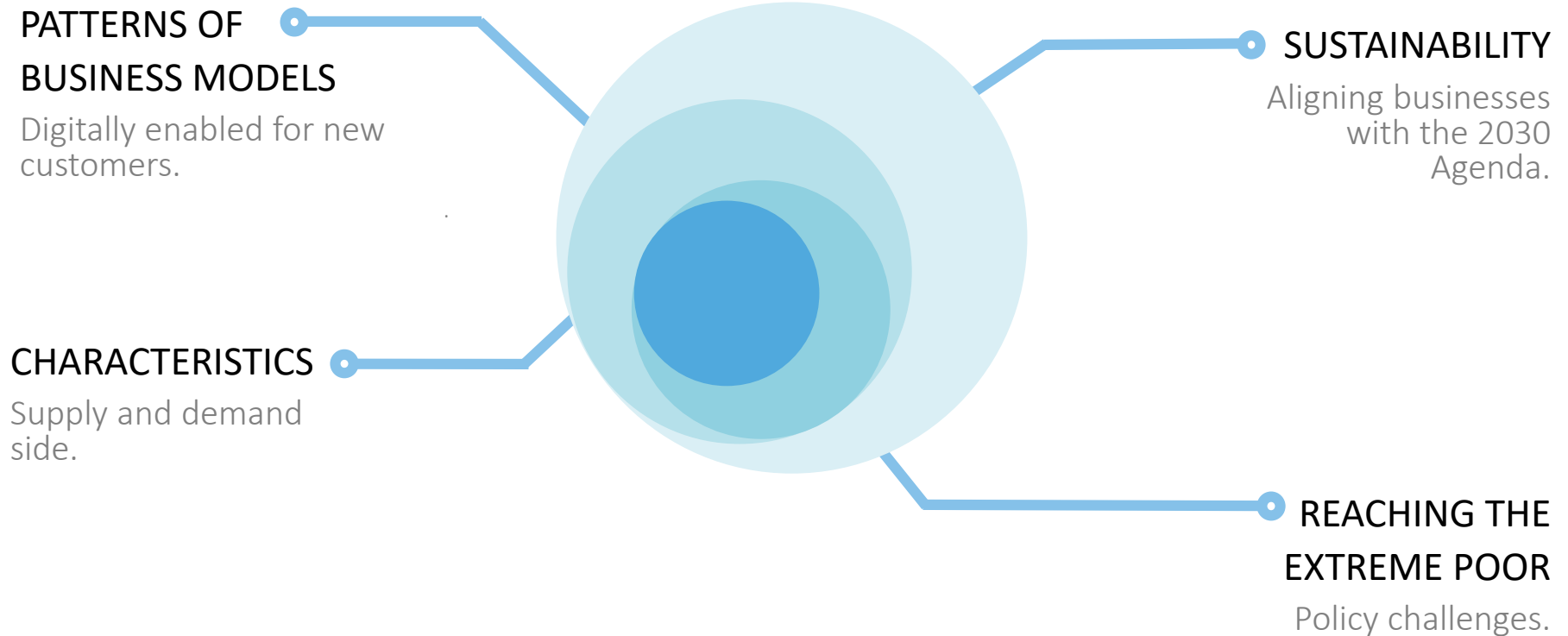
# Frontier technologies may also increase the technological gap between countries

- Frontier technologies tend to be applied first in industries that developed countries have the lead
- Activities using frontier technologies tend to concentrate geographically
- Some developing countries could use this window of opportunity to leapfrog
- Governments and the international community should continue to **promote international technological assessments and foresight exercises** to better understand the impact of rapid technological change on inequality and sustainable development
- Including by developing **models** that could capture the **effects of automation on developing countries**



# INNOVATIVE BUSINESS MODELS

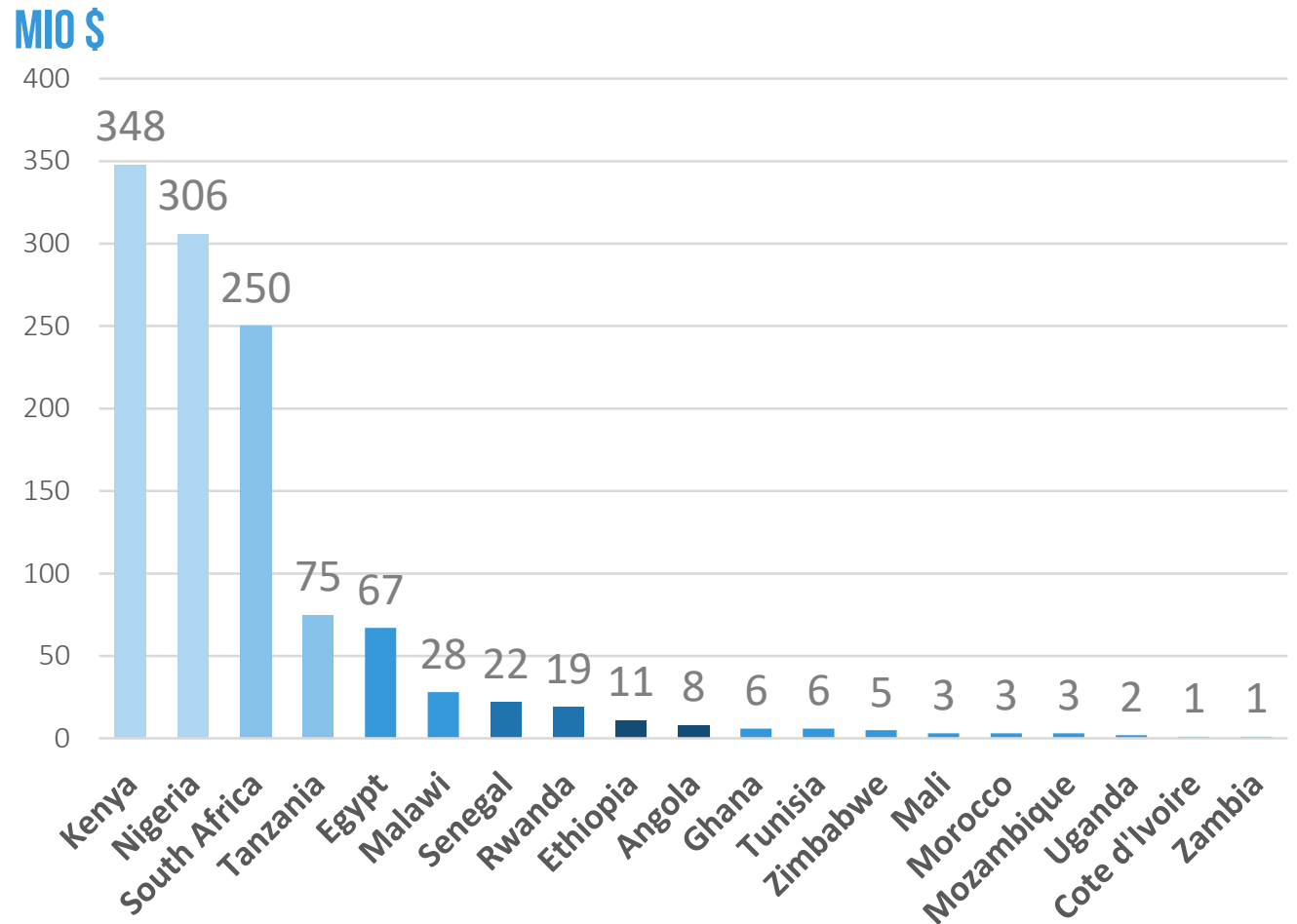
Addressing inclusiveness and sustainability



# MARKET POTENTIAL FOR BUSINESSES

Positive Development

**EQUITY FUNDING  
TO START-UPS IN AFRICA  
IN 2018**

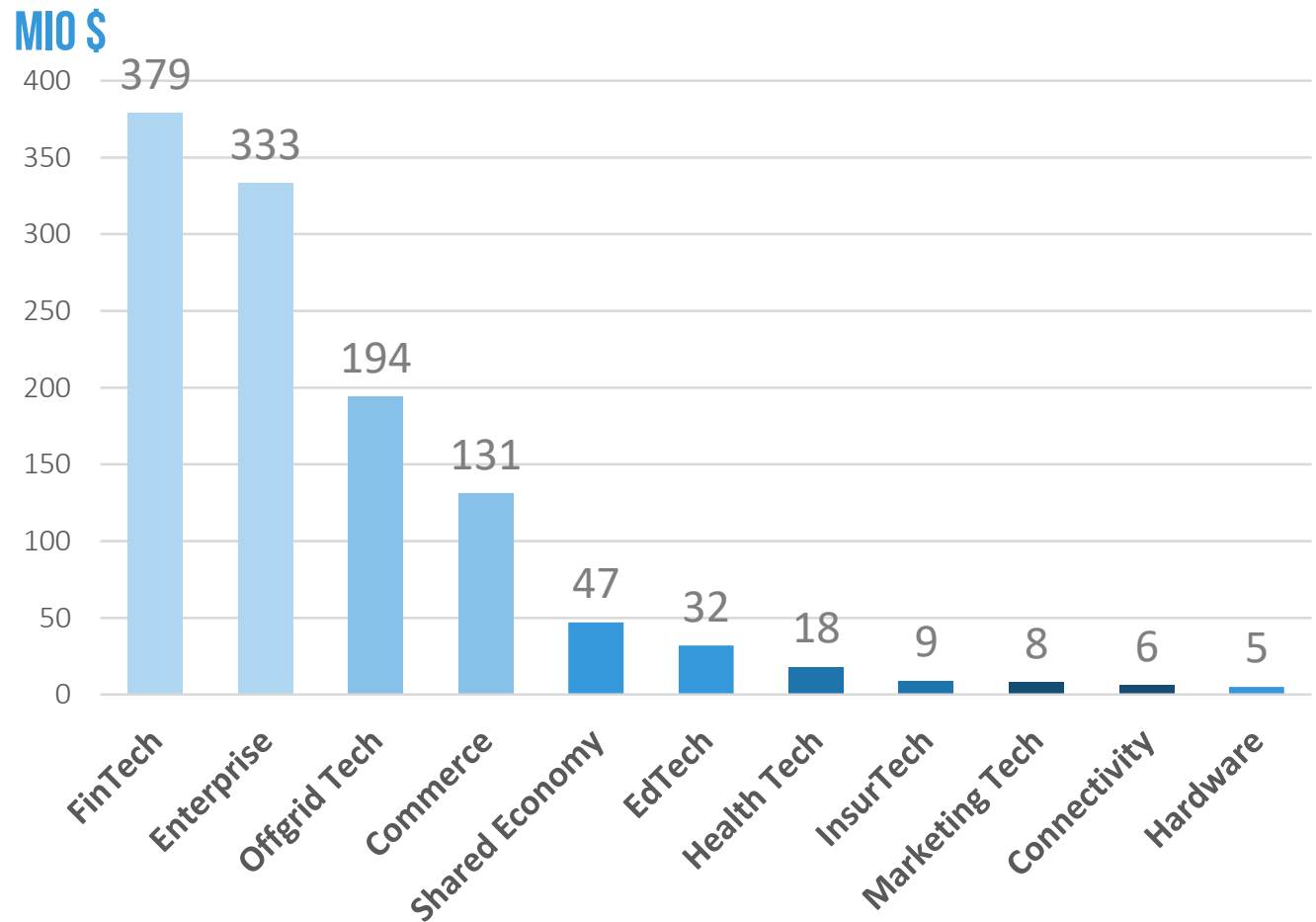


Source: Partech Partners, Partech Africa Fund Report 2018

# TOP 10 SECTORS

Large Variation

**TOTAL FUNDING  
TO START-UPS IN AFRICA  
PER SECTOR IN 2018**



# CHARACTERISTICS

Delivering quality products and services to low-income individuals

## SUPPLY SIDE

Re-thinking the value chain towards efficiency and longer customer relationships.

## DEMAND SIDE

**AFFORDABILITY** The initial price and running costs matter.

- Better value proposition
- Financing
  - Buying schemes: lease-to-own, utility-in-a-box
  - Non-traditional credit scores
  - Lean microfinance options

**ACCESS** Making accessing products easier.

- Improve delivery channels: addresses
- Time saving bundling of services
- Platforms to ease access to expertise



# BUSINESS MODEL PATTERNS

Digitally enabled and accessing new customer segments

Digital	Degree of digitization	Purely digital: 7			Digitally enabled: 16			Not necessarily digital: 1	
Value proposition	Product type	Physical: 13		Financial: 15		Human: 16		Intellectual property: 9	Hybrid: 19
	Differentiation strategy	Quality: 17		Customization: 11	Combination: 19		Access/convenience: 18	Price: 17	Network effects: 6
Value delivery	Target customers	Specific new customer segment: 22			Lock-in existing customers: 3			Other companies (B2B): 6	
	Value-delivery process	Brand and marketing: 9		Sales channel: 5		Sales model: 11		Customer relationship: 21	
Value creation	Sourcing	Make: 20			Buy: 4			No impact on sourcing: 2	
	Third parties involved	Suppliers: 5	Customers: 7		Competitors: 0		Multiple parties: 2	No one else involved: 14	
	Value-creation process	Research and design: 16		Supply: 15		Production: 12		Multiple steps: 15	
Value capture	Revenue model	Sell: 18		Lend/lease: 5		Intermediate: 8		Advertising: 0	
	Pricing strategy	Premium: 1		Cheap: 14		Dynamic: 4		Non-transparent: 8	
	Profit	For-profit: 20				Not for-profit: 2			
	Direct profit effect	Increase revenue: 9		Reduce cost: 6		Multiple effects: 3		No direct profit impact: 12	

Source: UNCTAD, based on Remane et al. (2017)

# SUSTAINABILITY AND BUSINESS

Aligning businesses with the 2030 Agenda



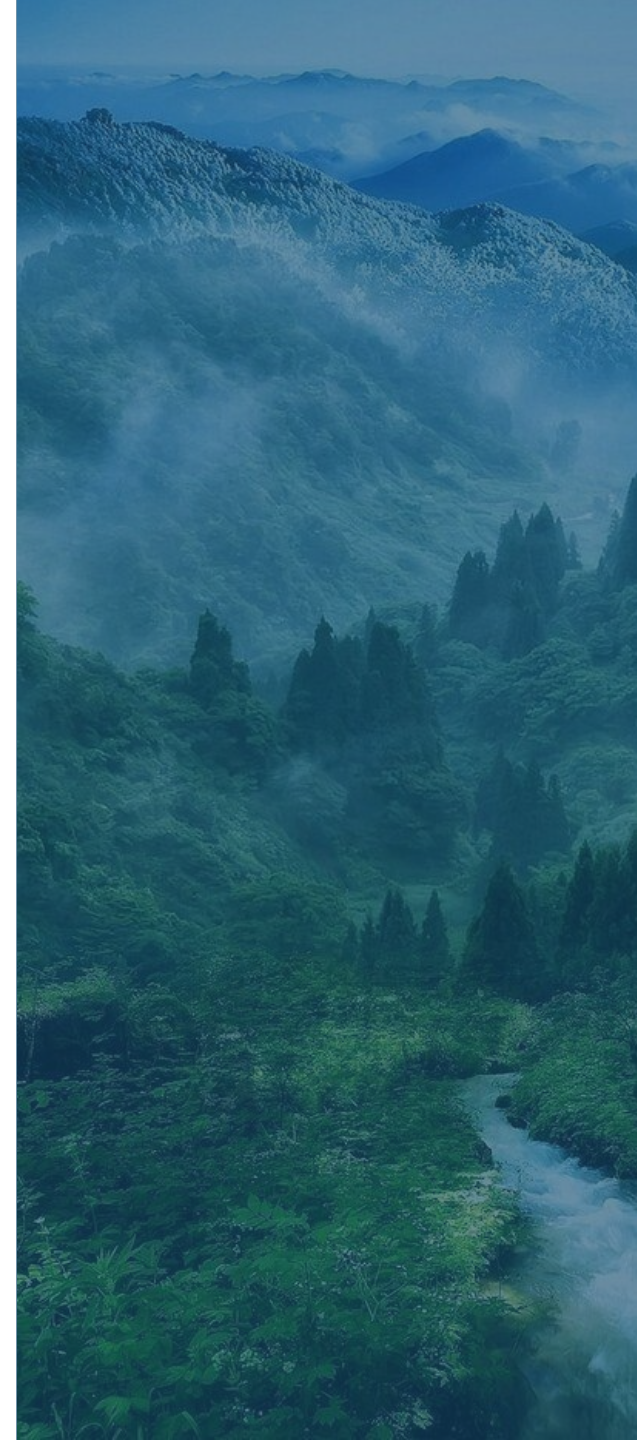
**Energy access** through off-grid solar powered solutions contribute to Goal 7, with important implications for health, society and the environment.



**Agriculture** needs to adapt to environmental degradation and climate change, making new practices essential. Mobile advisory services can help.



**Recycling** contributes to limiting material consumption through improved recycling models and new products incorporating recycled materials.



# REACHING THE POOR

Four key aspects to leverage innovation for inclusiveness and sustainability



## SKILLS

Skills to take advantage of digital technologies.

De-skilling of certain tasks for consistent service delivery.



## ENTREPRENEURS

Empowering those concerned to become entrepreneurs.

Thereby, diversify the needs entrepreneurs address.



## FINANCING

Bridge the gap for **traditional seed-funding investors** to finance ideas in markets new to them.

Challenge **impact investors** to invest in riskier new technologies rather proven concepts.



## GOVERNMENT

Shape the **enabling environment**.

Setting the **legal framework** in which businesses operate.

- Legal identity
- Data protection
- Competition policies



Checks and balances: Consumer awareness through technology reduces vulnerabilities

# THE ROLE OF STI POLICIES

## NATIONAL STRATEGIES FOR FRONTIER TECHNOLOGIES

Guide the use, adoption, adaptation and development of these technologies

Examples:

- Digital Belgium, Industrie 4.0, Digital Wallonia, beDigital.Brussels
- Brazil's National System for Digital Transformation (SinDigital), Digital Transformation Strategy (E-Digital)
- Digital Economy of the Russian Federation
- "Digital Turkey" Roadmap

## TECHNOLOGICAL FORESIGHT

Improve understanding of technological paths and potential social, economic and environmental impacts

- Example: E-Digital strategy of Brazil

## POLICIES TO BUILD TECHNICAL SKILLS

- Target education and training in frontier technologies: "Digital Turkey" Roadmap strategy aims not to leave anyone behind through training digital technology users
- Promote the basic literacy and development of basic digital skills: Examples from Belgium, Latvia, Lebanon, Turkey, UAE, USA
- Address the gender imbalance that exists in STEM fields, both in technical skills and entrepreneurship: examples from Brazil and the United States of America

## SUPPORT FOR NETWORKS AMONG FIRMS

To adopt new technologies and boost synergies and innovation

- Example: Belgium's Made Different support network of innovation clusters



# INTERNATIONAL COLLABORATION

## RESEARCH COOPERATION AND SCIENCE-POLICY INTERFACE

- Initiatives to make innovation more inclusive
- International joint research ventures to promote STI for SDGs
- Bridge the gap between cutting-edge technological development and international policy-making

## CAPACITY BUILDING

- International forums and mechanisms: CSTD, STI Forum, and the AI for Good Summit
- UN System agencies support Member States in inclusive STI policy capacity building

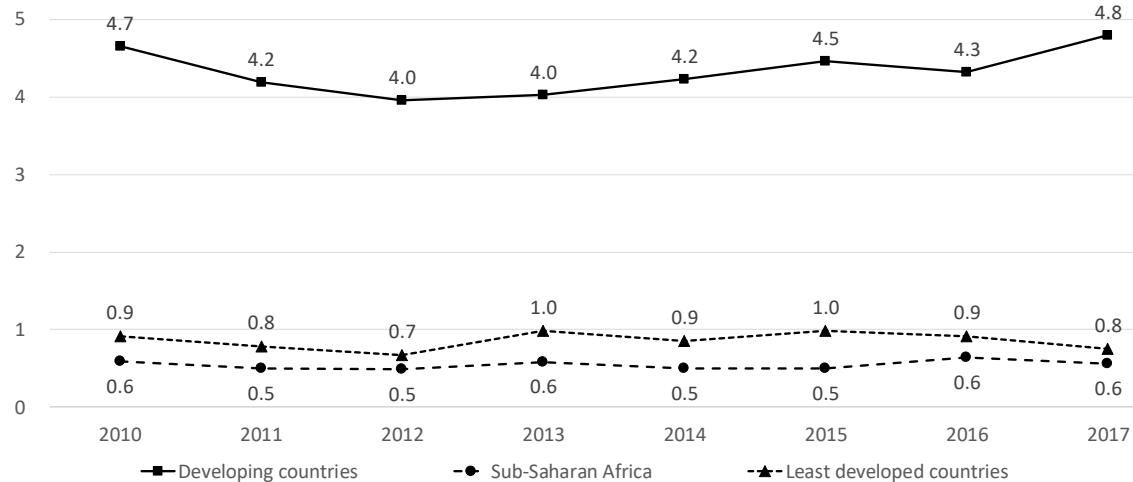
# INTERNATIONAL COLLABORATION

Official Development Assistance

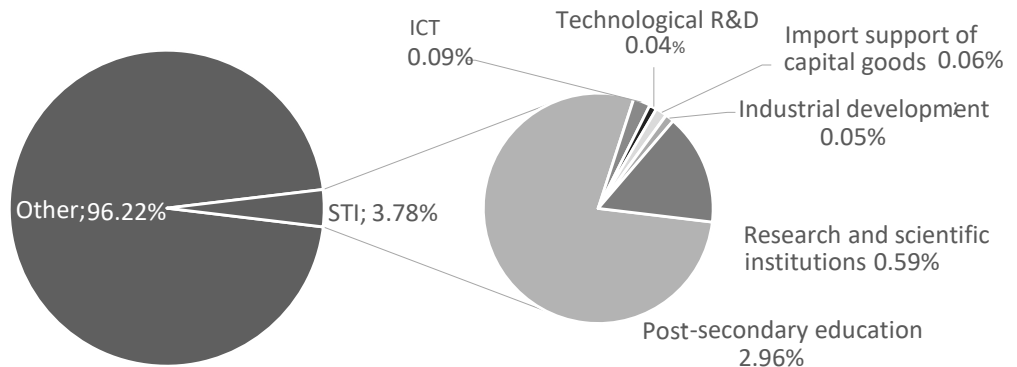
## ODA TO DEVELOPING COUNTRIES TARGETING STI CAPACITIES

- ODA HAS NOT INCREASED OVER THE PAST DECADE
- IT HAS REDUCED TO LDC
- REMAINED THE SAME FOR SSA
- ONLY 3.8% OF TOTAL ODA LINKED TO STI SECTORS

## BILLION US\$ (CONSTANT PRICES)



## SHARE OF ODA, 2017



# POLICY CONSIDERATIONS

## Creating the ecosystem for inclusive and sustainable innovation on frontier technologies

- National Digital Agendas
- Upgrade skills and knowledge of innovators
- Ensure the required legal and regulatory system
- Engage local industry
- Life-long learning and retraining programs
- Reinforce technology transfer and strengthen linkages
- Build capacity on application of frontier technology for SDGs
- Strengthen R&D and innovation in frontier technologies

## Providing directionality to technological change and mitigating risks

- Facilitate labour mobility
- Promote decent digital jobs
- Establish digital platforms
- Facilitate adaptation to the local context and culture
- Engage social and labour-related institutions
- Facilitate fair relation between workers and employers
- Establish a periodic dialogue among STI stakeholders
- Set direction, basic principles and ethical guidelines
- Develop scenarios and prepare for changes

## International cooperation

- Discuss ethical principles
- Connect innovative firms worldwide
- Establish a dialogue
- Share experiences
- Encourage a volunteer mentorship mechanism
- Harness existing global platforms
- Share information on successful business models
- Assist in bridging the multidisciplinary digital divides



# THANK YOU FOR YOUR ATTENTION

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