

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

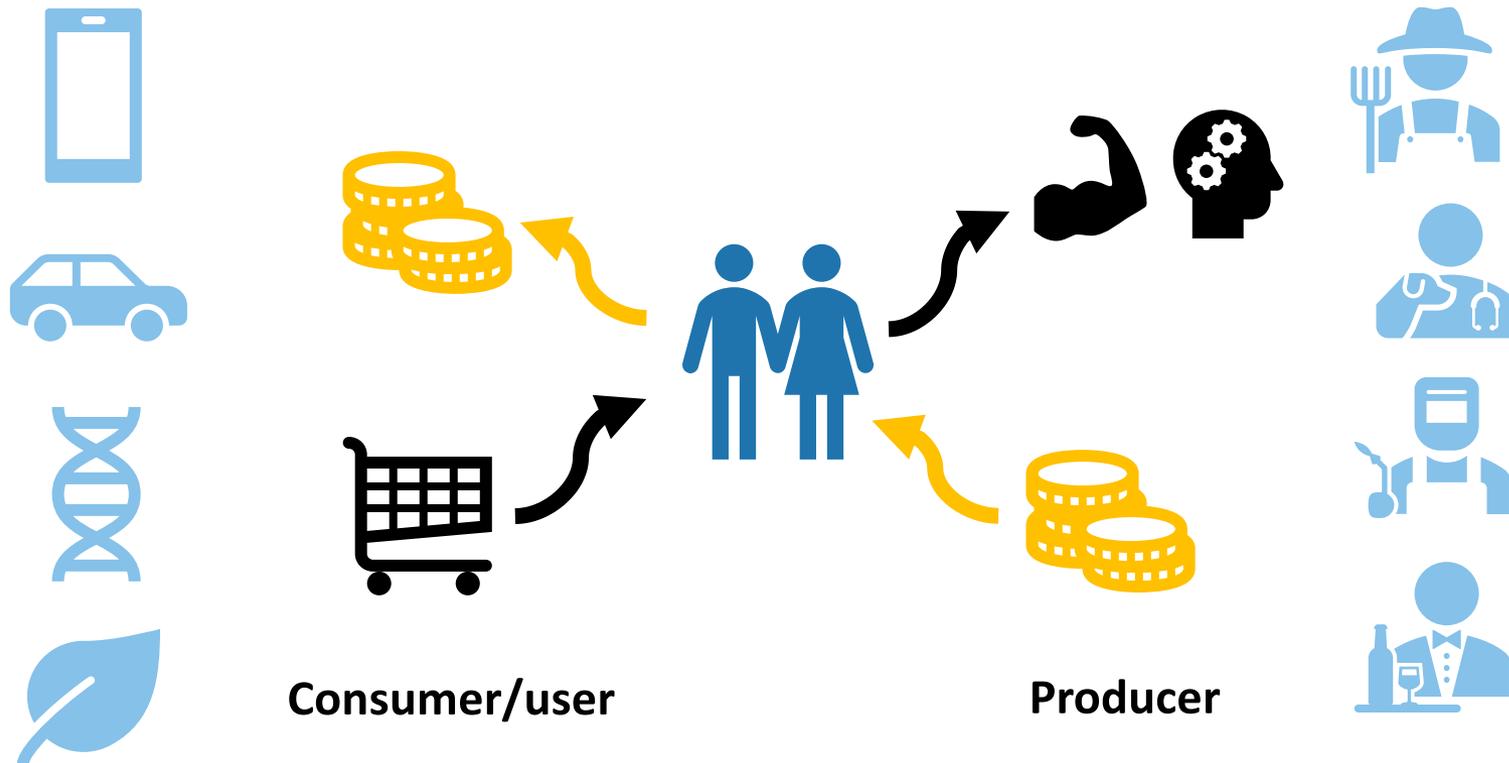
THE ROLE OF STI POLICIES

INTERNATIONAL COLLABORATION

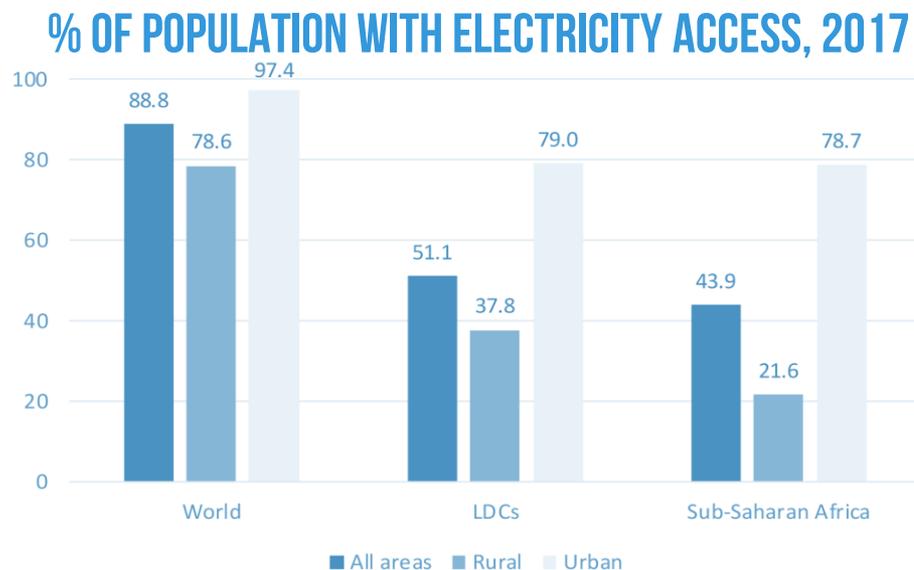
POLICY CONSIDERATIONS



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

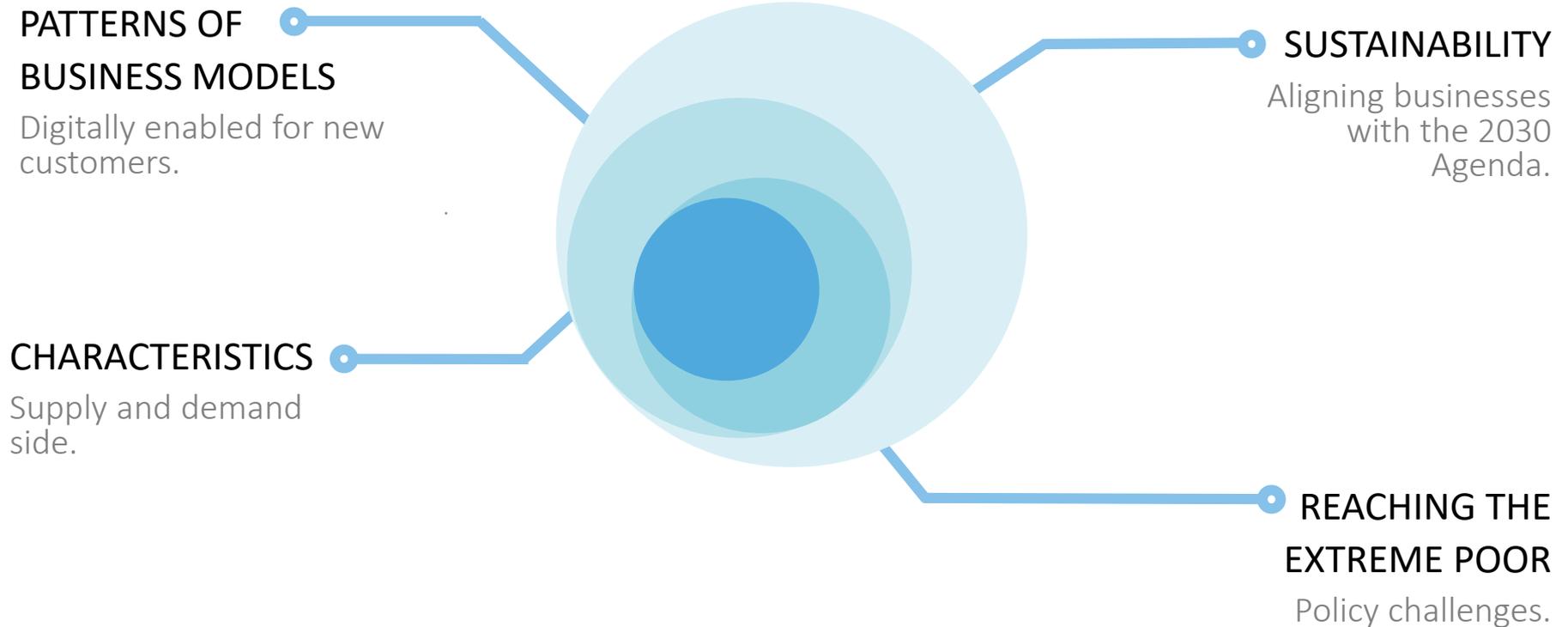
- Winners take all & market concentration
- Technology products bundled with other products and services
- But innovation promotion can prevent this inequality due to market concentration from being perpetuated
- Governments and other stakeholders could support innovation by creating programmes and mechanisms 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

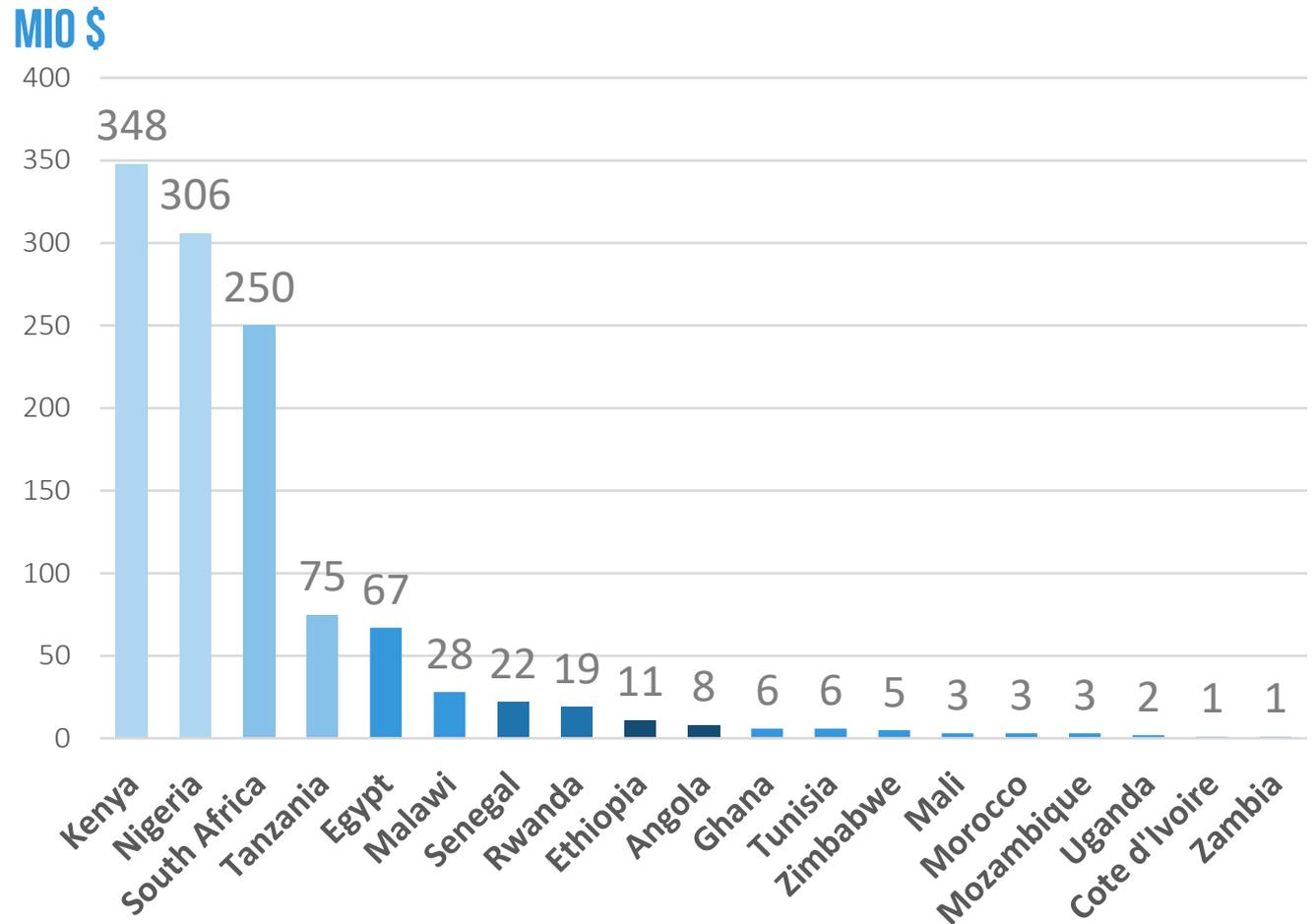
Addressing inclusiveness and sustainability



MARKET POTENTIAL FOR BUSINESSES

Positive Development

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

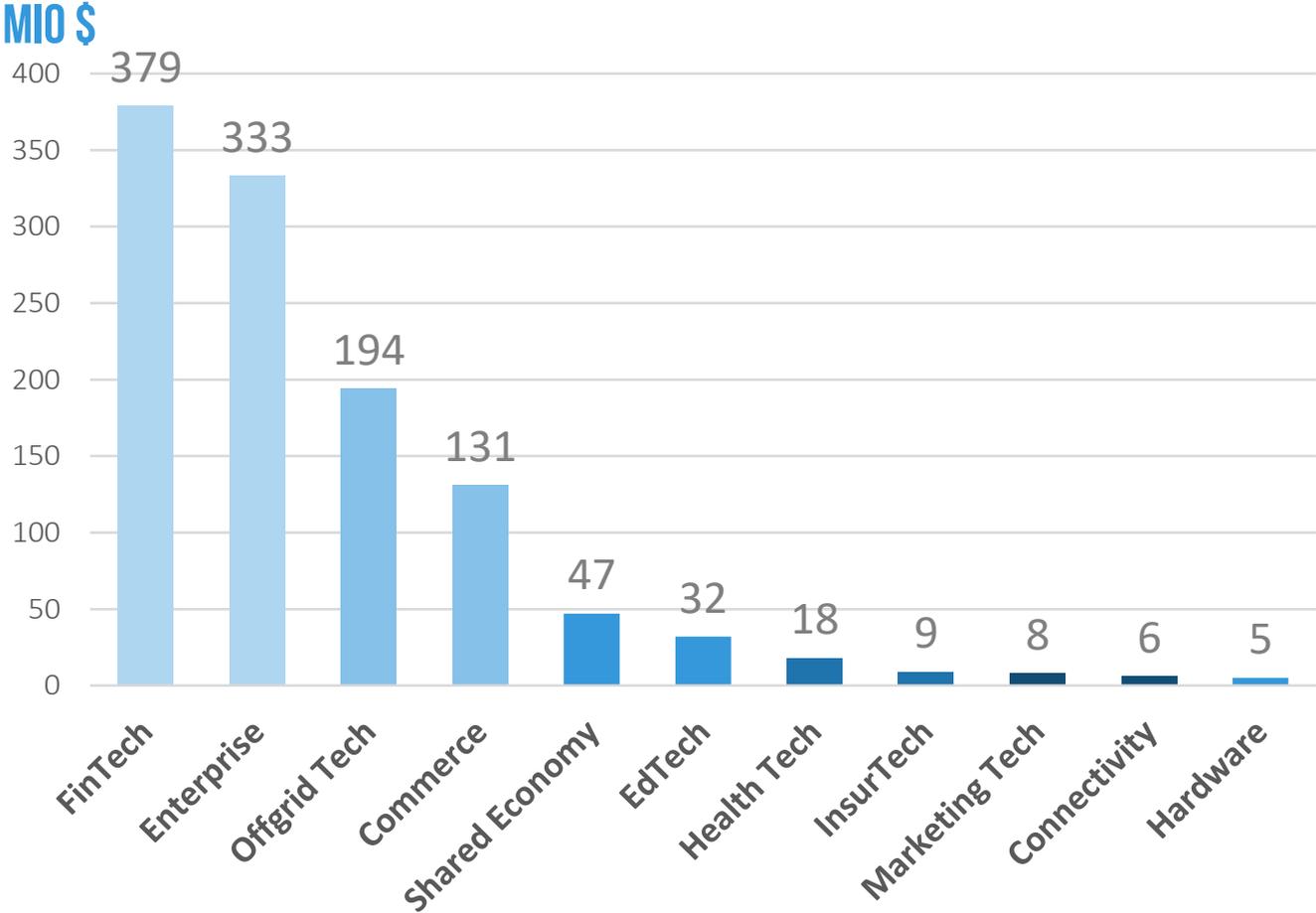


Source: Partech Partners, Partech Africa Fund Report 2018

TOP 10 SECTORS

Large Variation

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



Source: Partech Partners, Partech Africa Fund Report 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



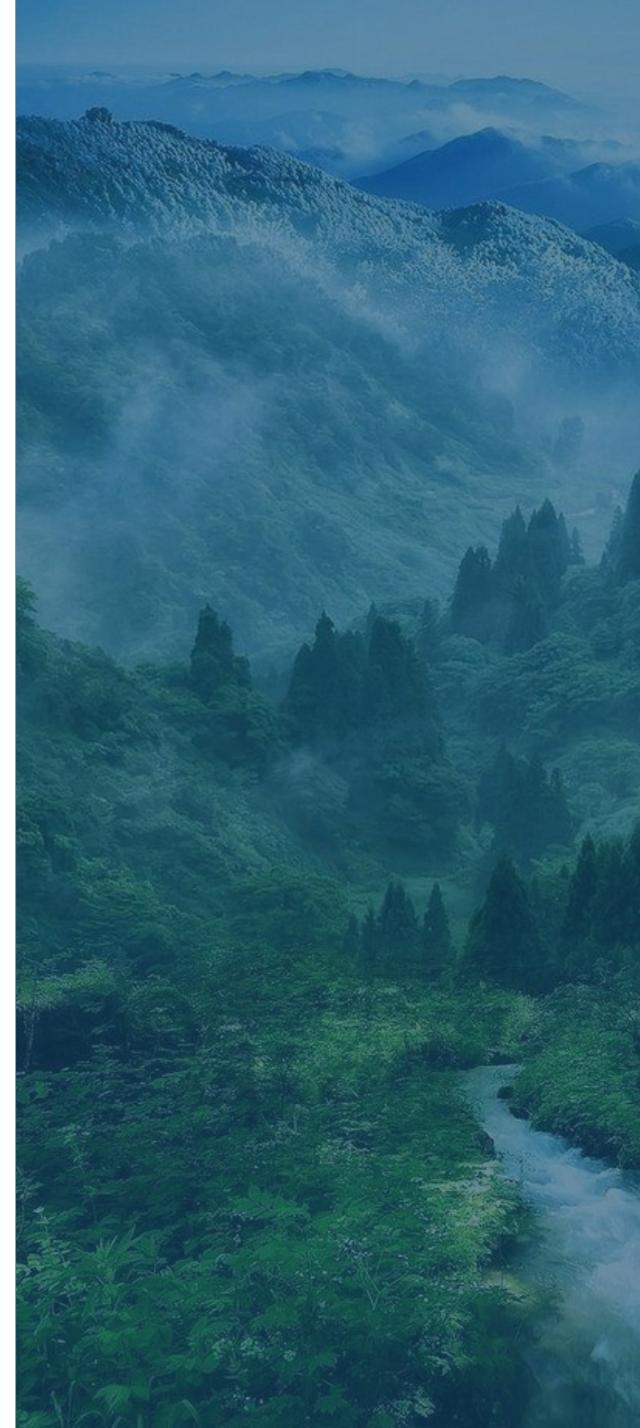
Energy access through off-grid solar powered solutions contribute to Goal 7, with important implications for health, society and the environment.



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

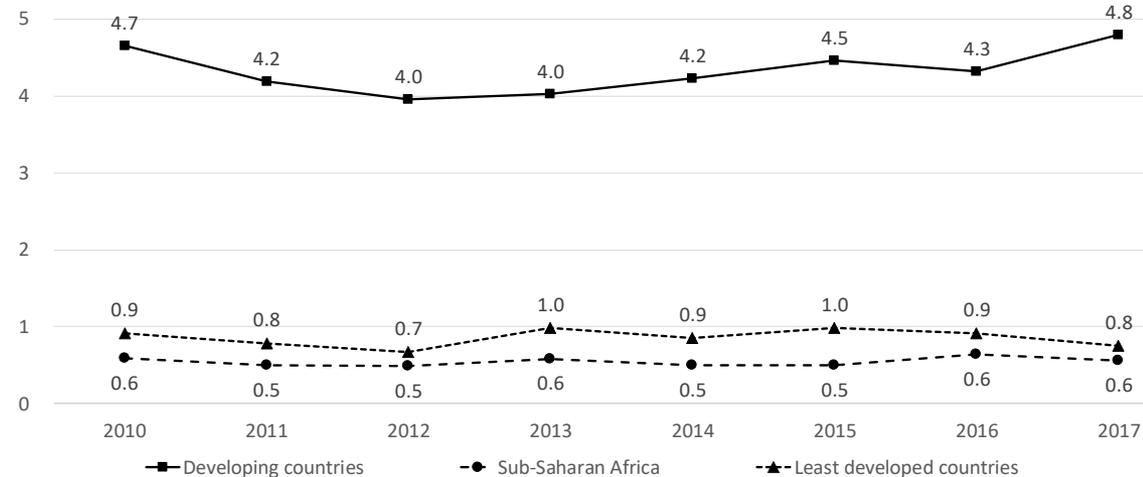
INTERNATIONAL COLLABORATION

Official Development Assistance

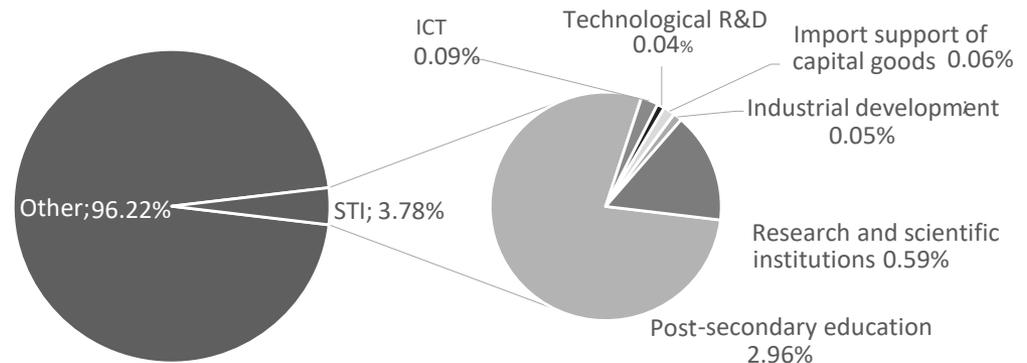
ODA TO DEVELOPING COUNTRIES TARGETING STI CAPACITIES

- 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

[UNCTAD.ORG/CSTD](https://unctad.org/CSTD)

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