



The Impact of rapid techological change on sustainable development

with particular reference to the SDG9

Cecilia Ugaz Estrada

Policy research and statistics department

UNIDO





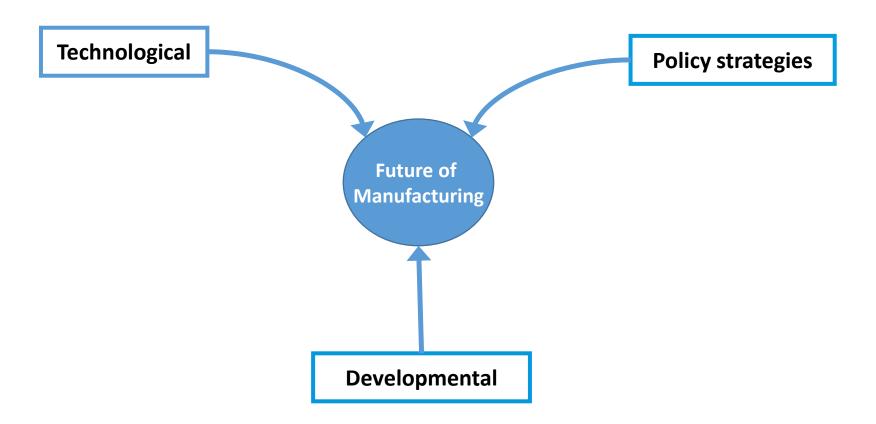








Dimensions shaping the future of manufacturing













Technological dimension









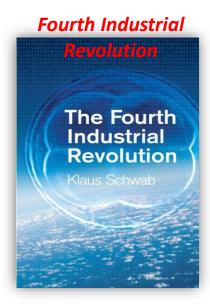






Increasing attention to new technologies, under different labels

Next Production Revolution The Next Production Revolution PLICATIONS FOR GOVERNMENTS AND BUSINESS







- Digital technologies
- 3D printing

⊗
»
OECD

- **Biotechnologies**
- New Materials
- Nanotechnologies
- Physical (autonomous vehicles, 3D printers, robotics, new materials)
- Digital (IoT, block chain, platforms)
- Biological (genetics)

- Smart automation
- *Internet of things*
- Advanced robotics
- 3D Printing

- Big data, IoT and IA
- 3D printing
- Biotechnology
- Adv. materials & nano. Renewable energy
- Satellites and drones
- Blockchain









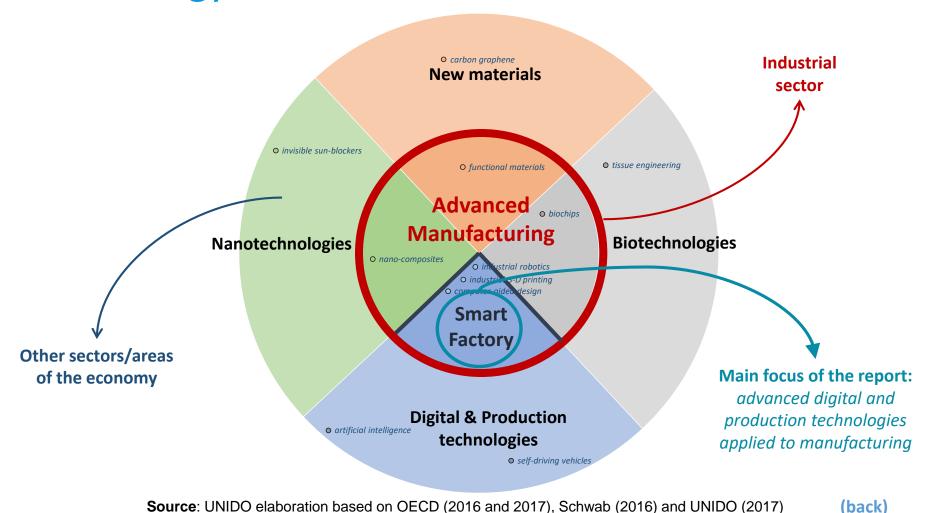








Technology focus of IDR 2020

















Technology ladder: four generations in digital technologies

The smart factory represents the 4.0: frontier in the domain of digital smart How to climb this "pyramid"? factory and production technologies ...or there are windows Integrated production of opportunity for use of ICTs, digital technologies and But it coexists with *leapfrogging?* automation with integration and connection in all activities and areas of the company (e.g. older generations internet-based sales support and support of digital and system) production technologies ean production flexible or semi-flexible automation using ICTs without integration or with only partial integration between the areas of the company (e.g. CAD-CAM, which integrates design and production) gid production Rigid and isolated automation using digital technologies and ICTs in a timely manner and in a Cumulative process of technological learning (passing through each generation)...?

Source: UNIDO elaboration based on project "Brazil Industry 2027", CNI and IEL (2017).













(back)



Policy dimension











Policy strategies

Learning and experimentation

Multiple interactions / coordination

Converging policy realms

Distributed power

Context specific





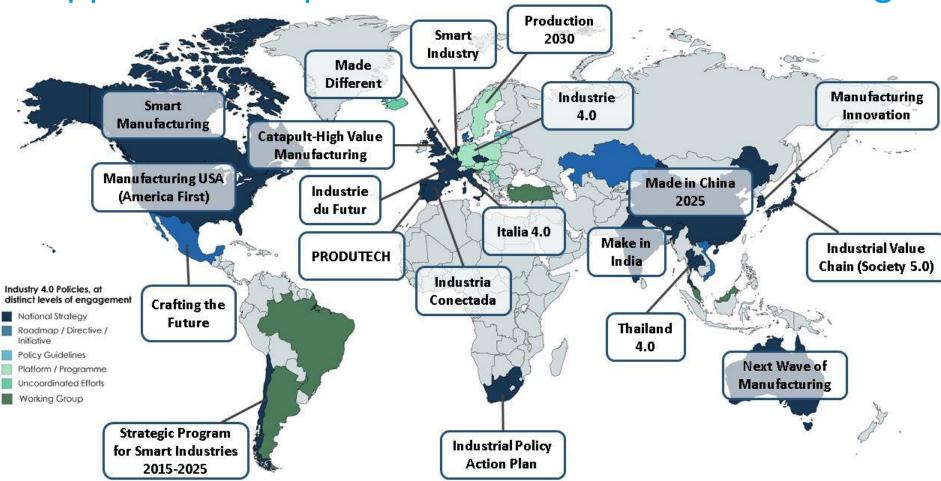








Approaches to promote advanced manufacturing



Source: UNIDO elaboration based on Santiago (2018) and EU digital transformation monitor.















Development dimension















Rapid technological change and gaps between and within countries

Emerging economies

- Changing framework conditions to catch up / leapfrog copying and adapting to changing technological and market dynamics
- -Upgrading and modernization through new technology absorption and use
- -Deepening digitalization



Higly industrialized economies: -Maintain industrial leadership -Foster innovation in frontier technologies -New market creation: production technologies / platform technologies



Least developed countries

- Avoid falling behind copying and adapting to changing technological and market dynamics
- Finding new pathways towards industrialization
- -Fostering digitalization

Country-level strategic responses depend on accumulated technological, productive and other required capabilities: "twin challenge" of adaptation and survival, versus industrial leadership











Research agenda to analyze the impacts of rapid technological change on ISID

- Drivers / barriers for the development, diffusion and use of advanced technologies across the global south;
- Determinants of readiness to adopt new, advanced technologies at the firm / sector level;
- Global production and innovation value chains: restructuring, governance and strategic inclusion (firms, sectors, countries) across distinct levels of development;
- Manufacturing-related services: an opportunity to catch-up?
- International policy coordination and new challenges on capability building;
- Implications on leaving no-one behind: gender, employment, skills, spatial/regional development.











