The Impact of rapid techological change on sustainable development

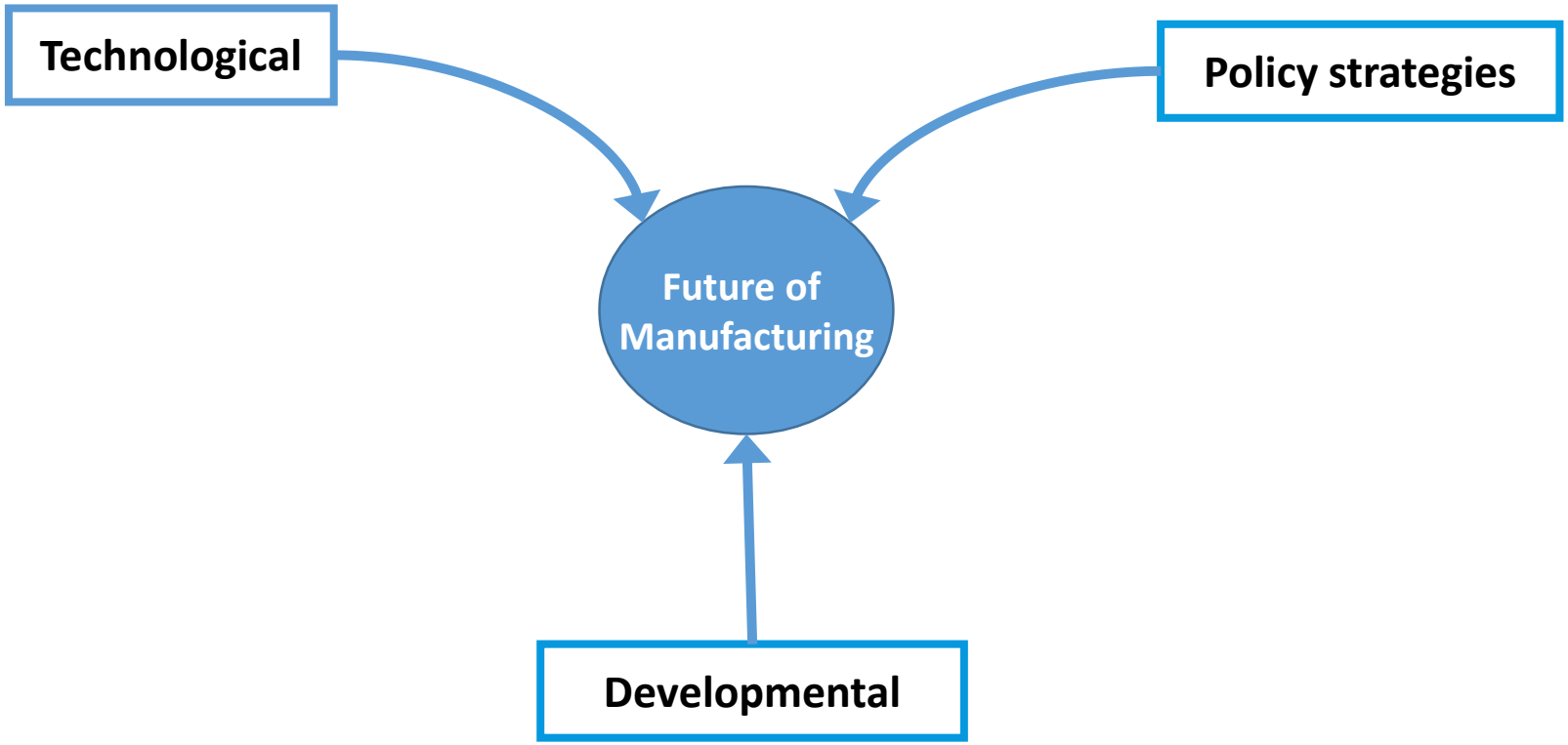
with particular reference to the SDG9

Cecilia Ugaz Estrada

Policy research and statistics department

UNIDO

Dimensions shaping the future of manufacturing



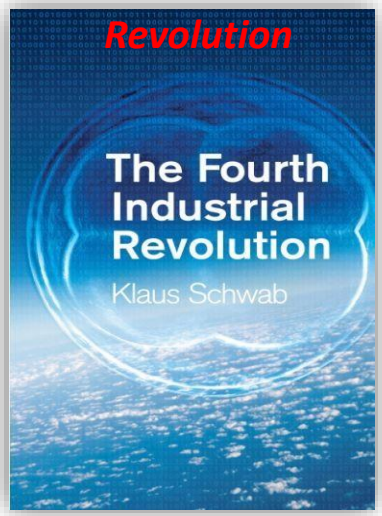
Technological dimension

Increasing attention to new technologies, under different labels

Next Production Revolution

- *Digital technologies*
- *3D printing*
- *Biotechnologies*
- *New Materials*
- *Nanotechnologies*

Fourth Industrial Revolution



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

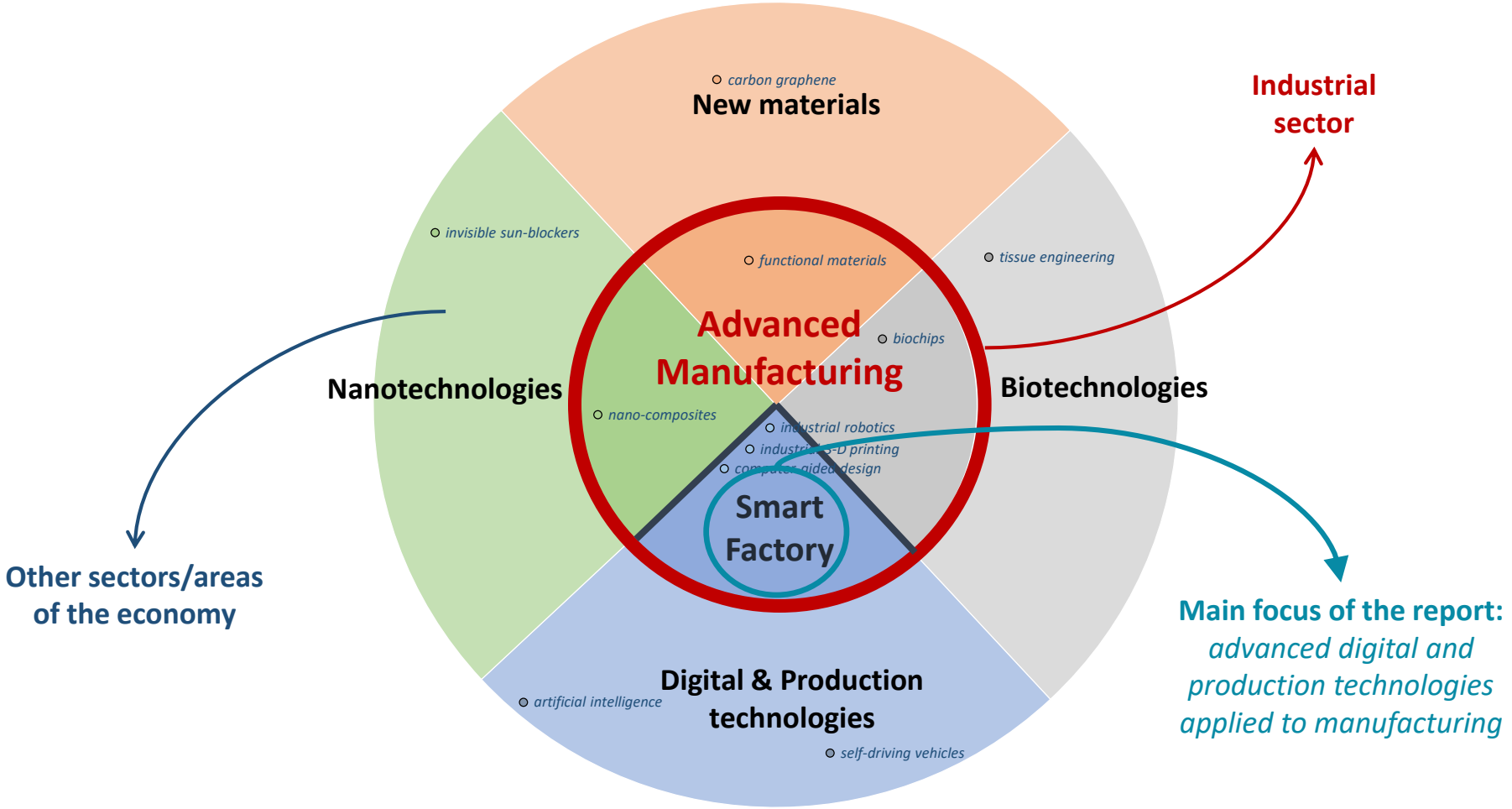
Industry 4.0

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

Frontier technologies

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

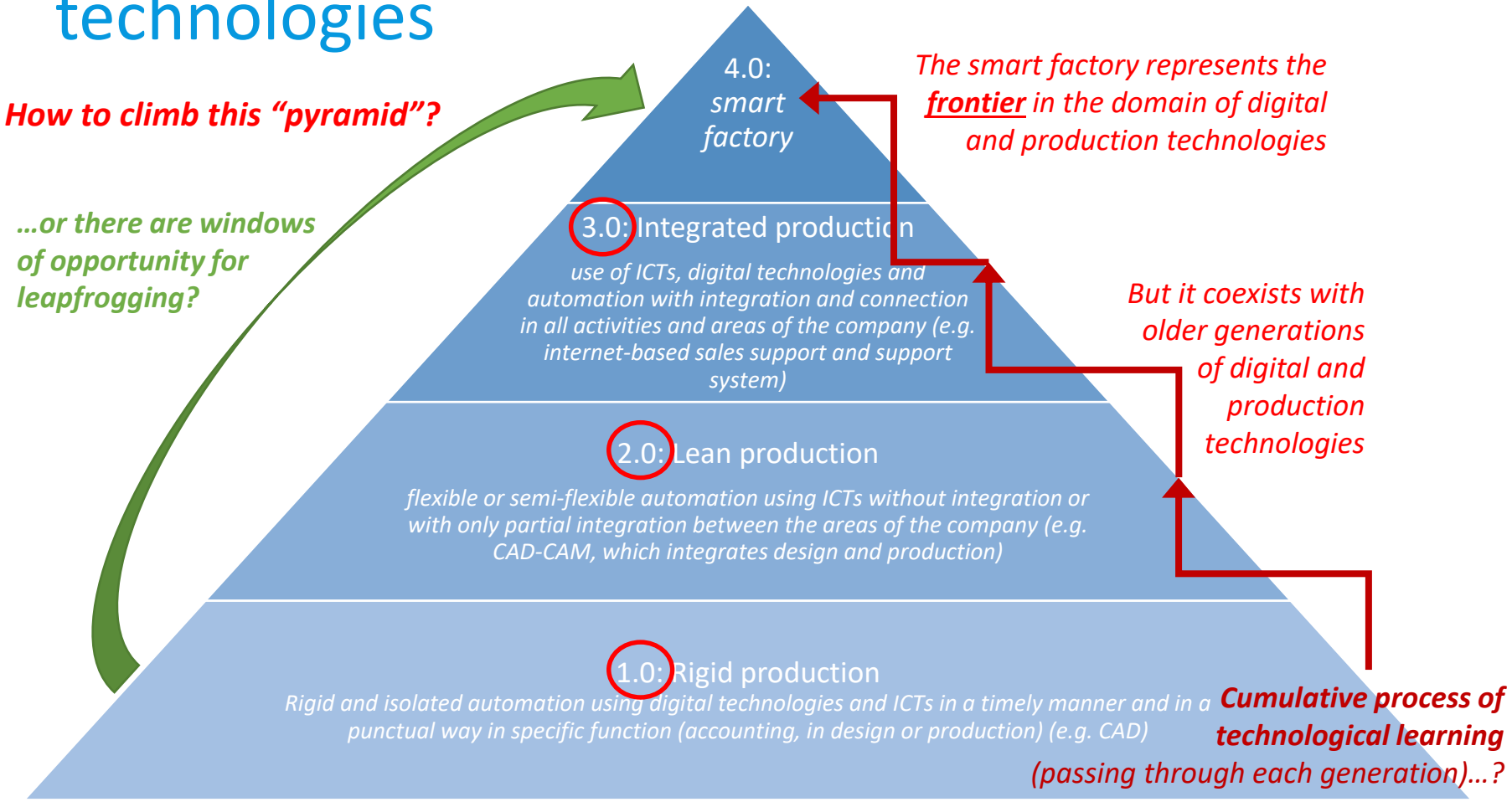
Technology focus of IDR 2020



Source: UNIDO elaboration based on OECD (2016 and 2017), Schwab (2016) and UNIDO (2017)

(back)

Technology ladder: four generations in digital technologies



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

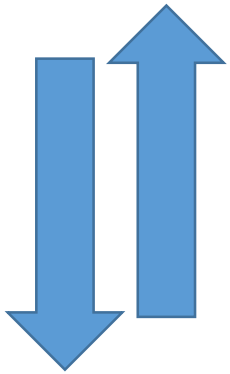
(back)

Policy dimension

• Policy strategies

Learning and experimentation

Multiple interactions / coordination

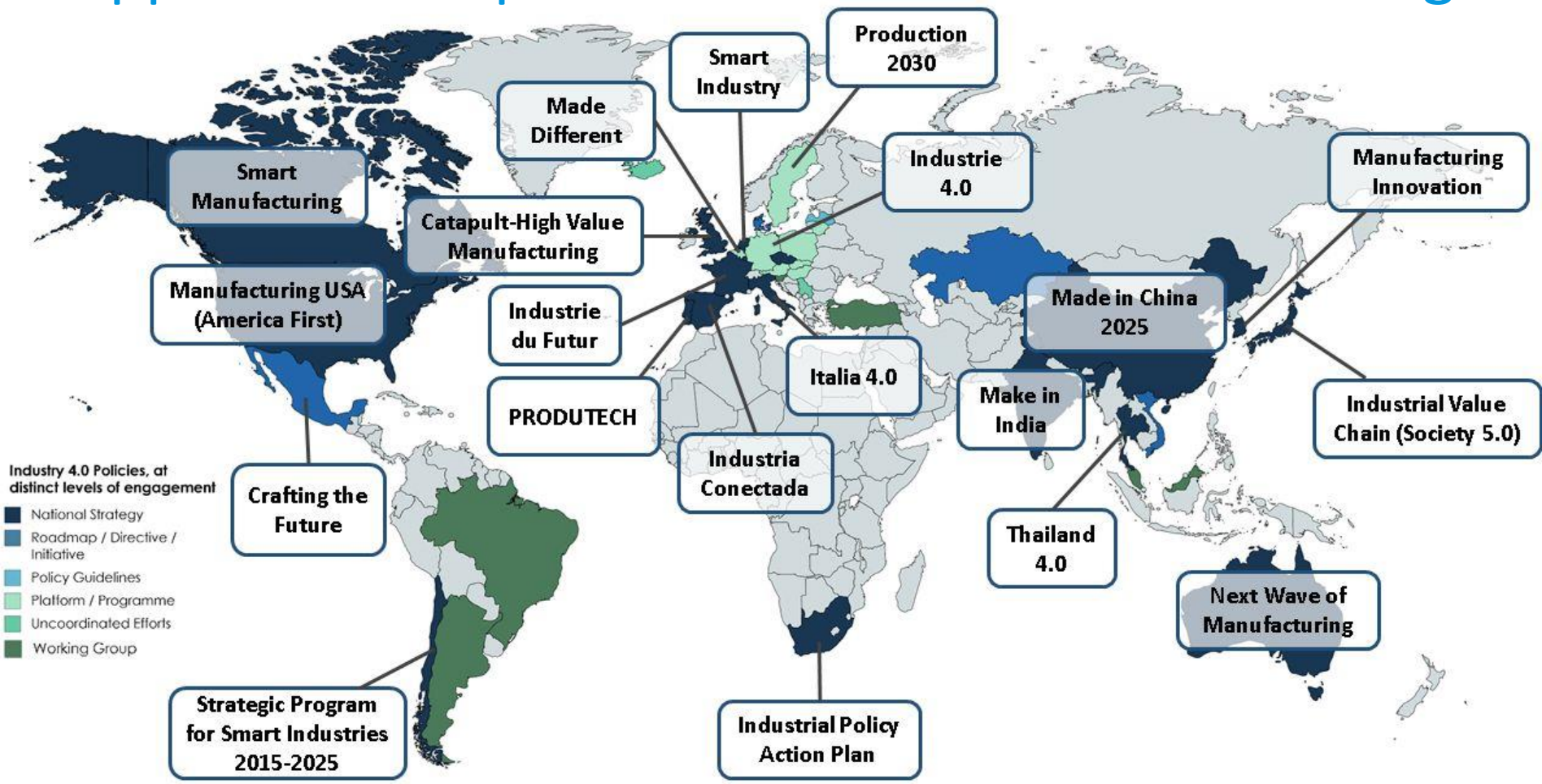


Converging policy realms

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.