



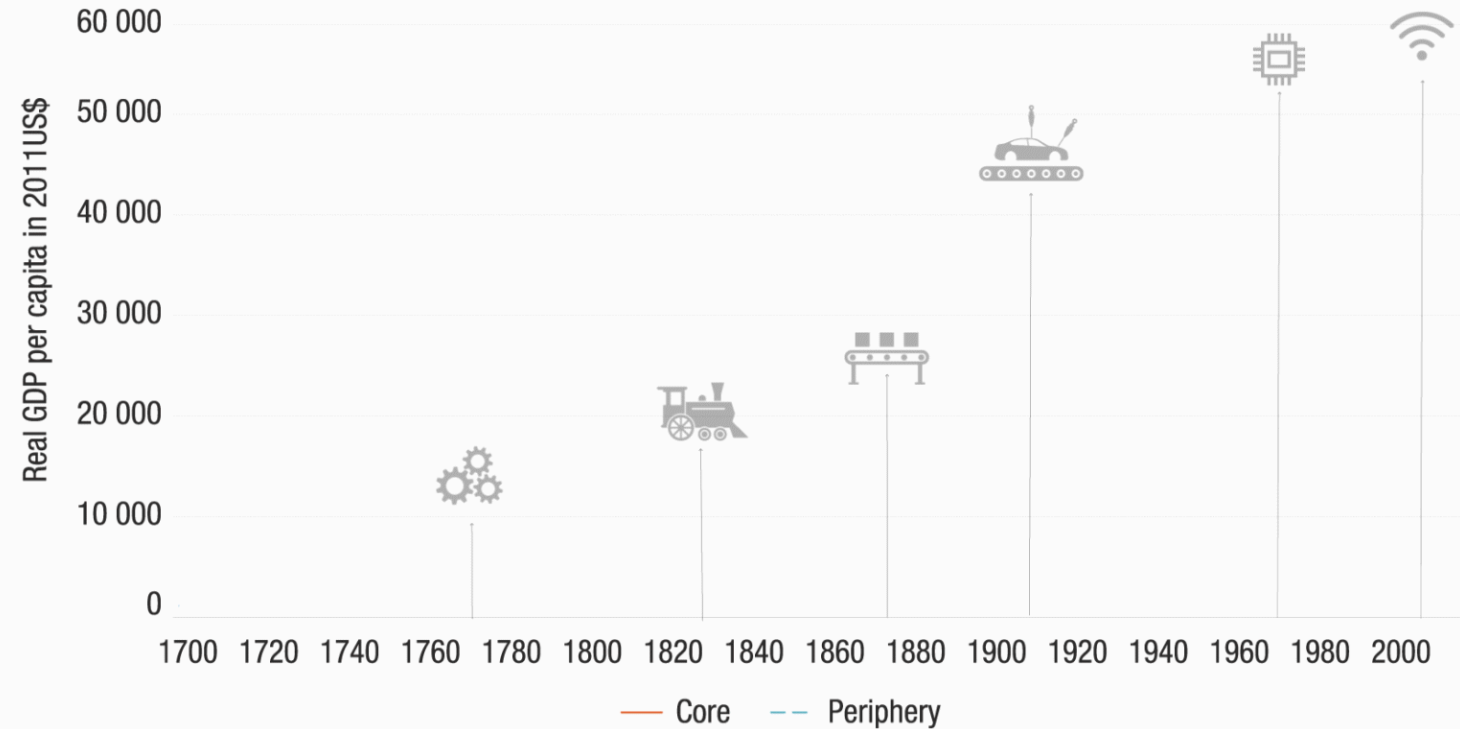
# Technological Assessment in developing countries

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# CATCHING THE WAVES

The great divide, and waves of technological change.

## Technological change and inequality through the ages



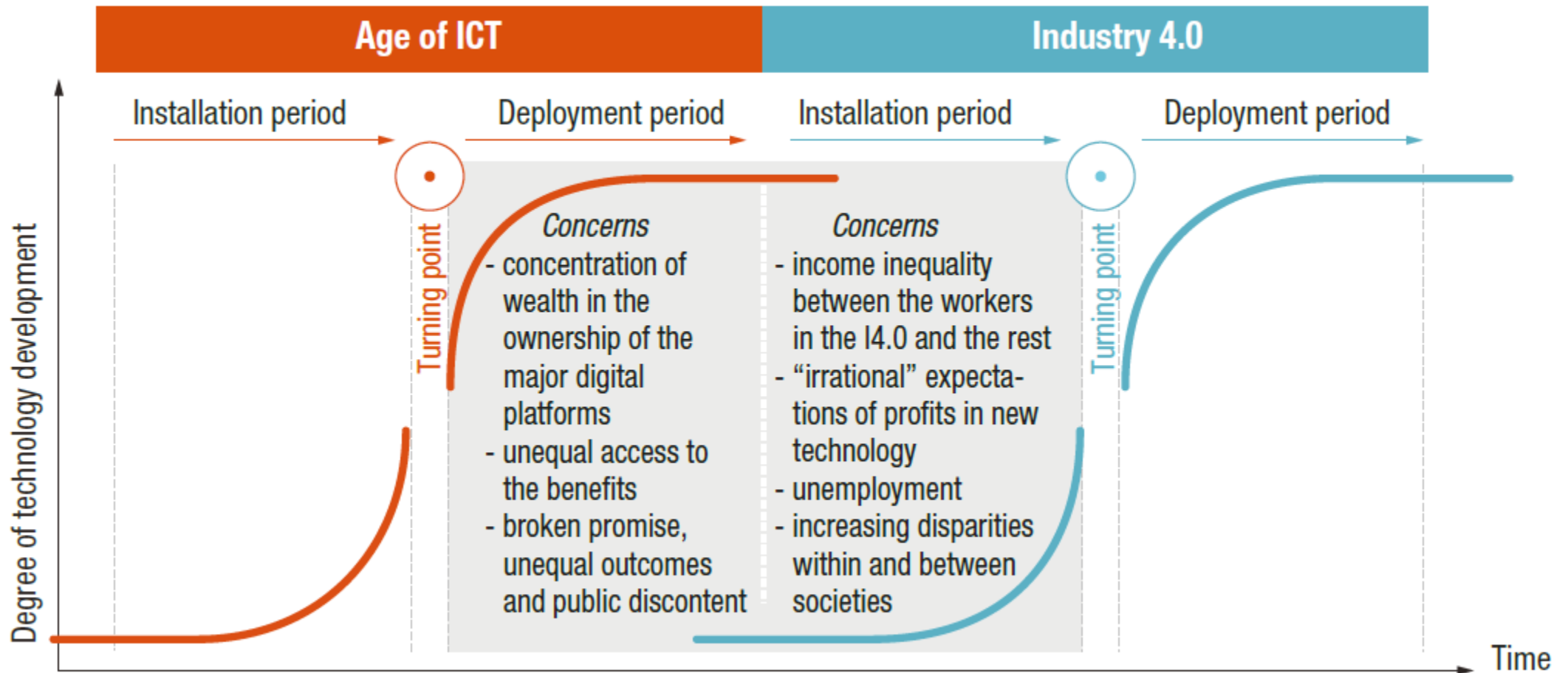
Source: UNCTAD's Technology and Innovation Report 2021

Source: UNCTAD, based on data from Maddison Project Database, version 2018, Bolt et al. (2018), Perez (2002), and Schwab (2013).

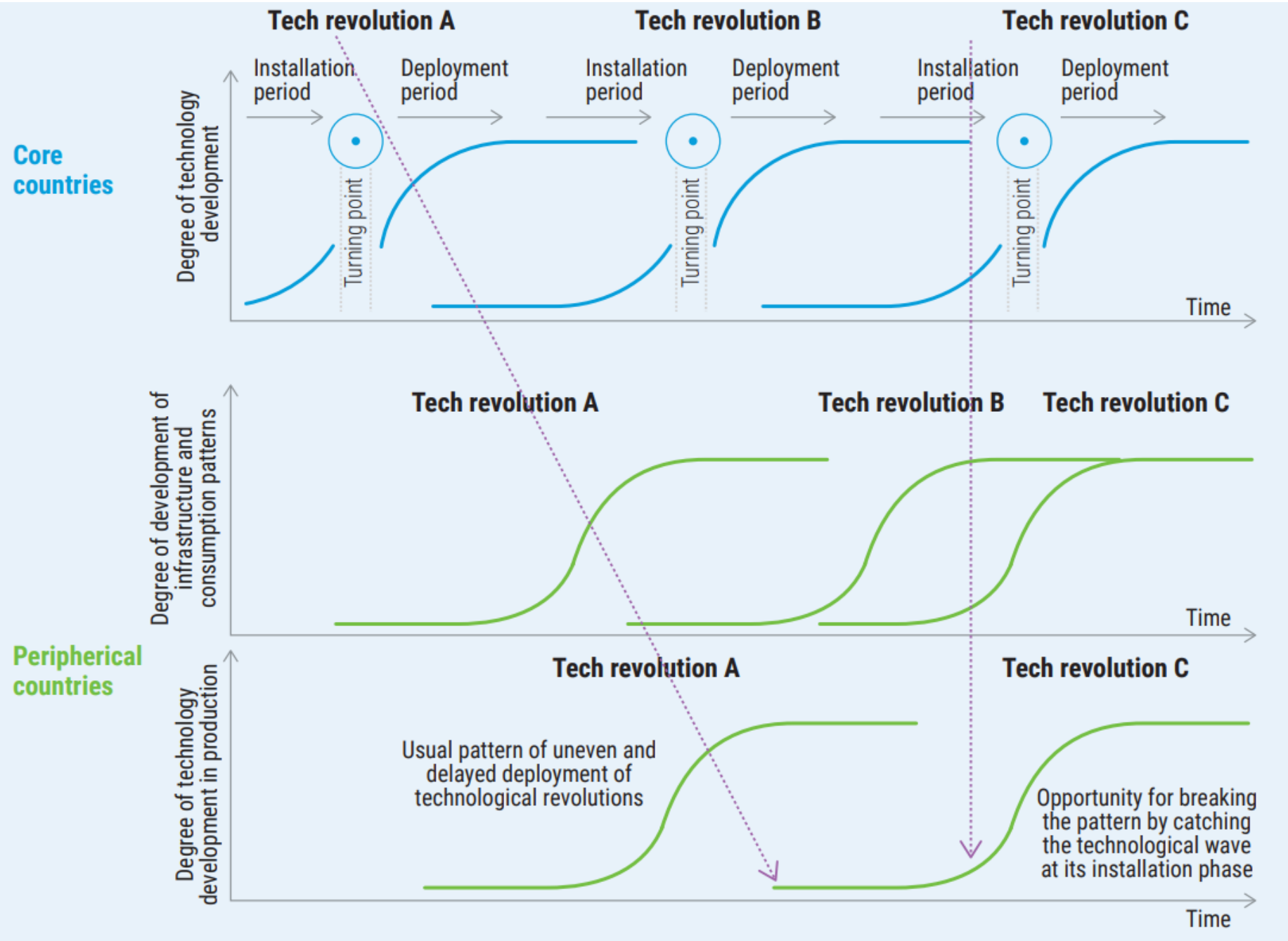
Notes: "Core" corresponds to Western Europe and its offshoots (i.e. Australia, Canada, New Zealand, the United States) as well as Japan. "Periphery" corresponds to the world, excluding the "core" countries.

# TWO-PHASE REVOLUTIONS

## Technological revolutions and inequalities



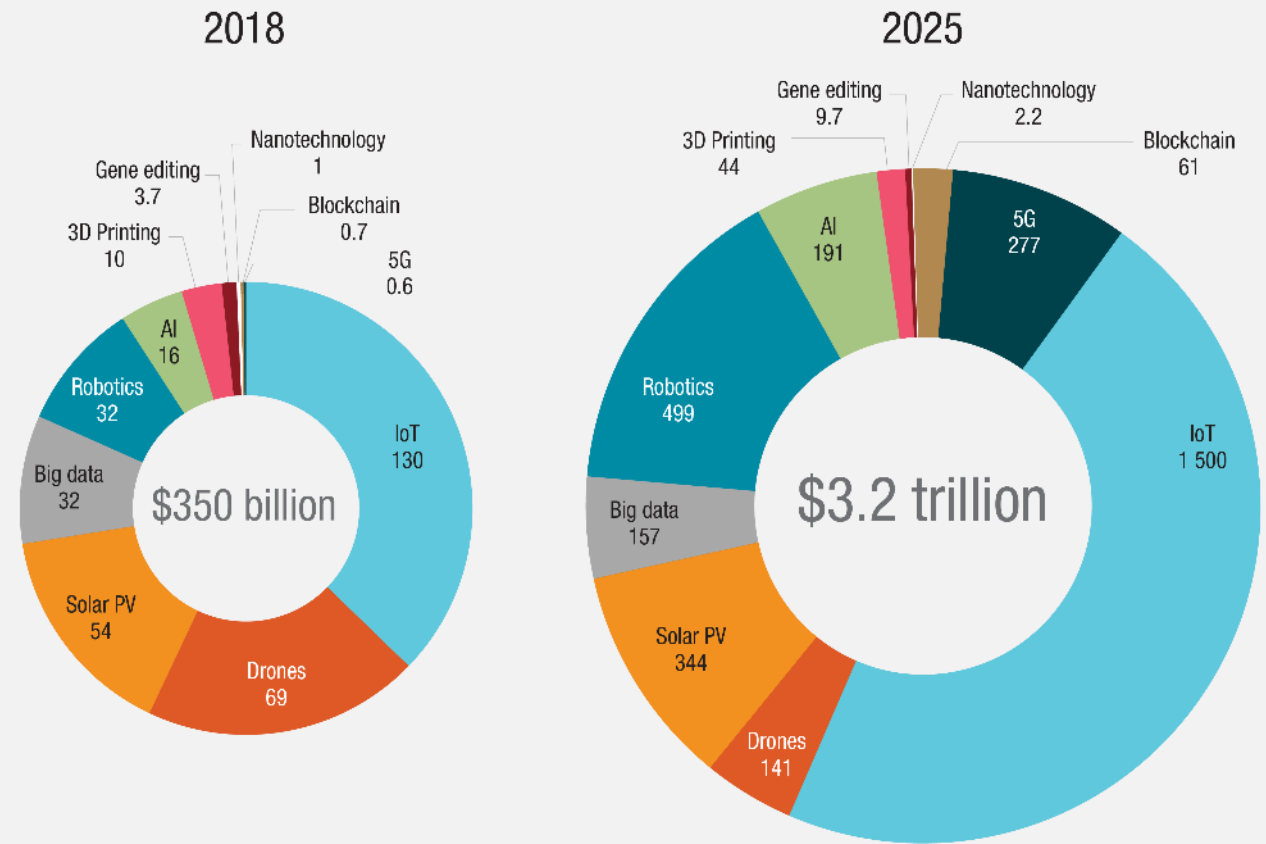
Source: UNCTAD based on Perez (2002).



Source: UNCTAD based on Perez (2002).

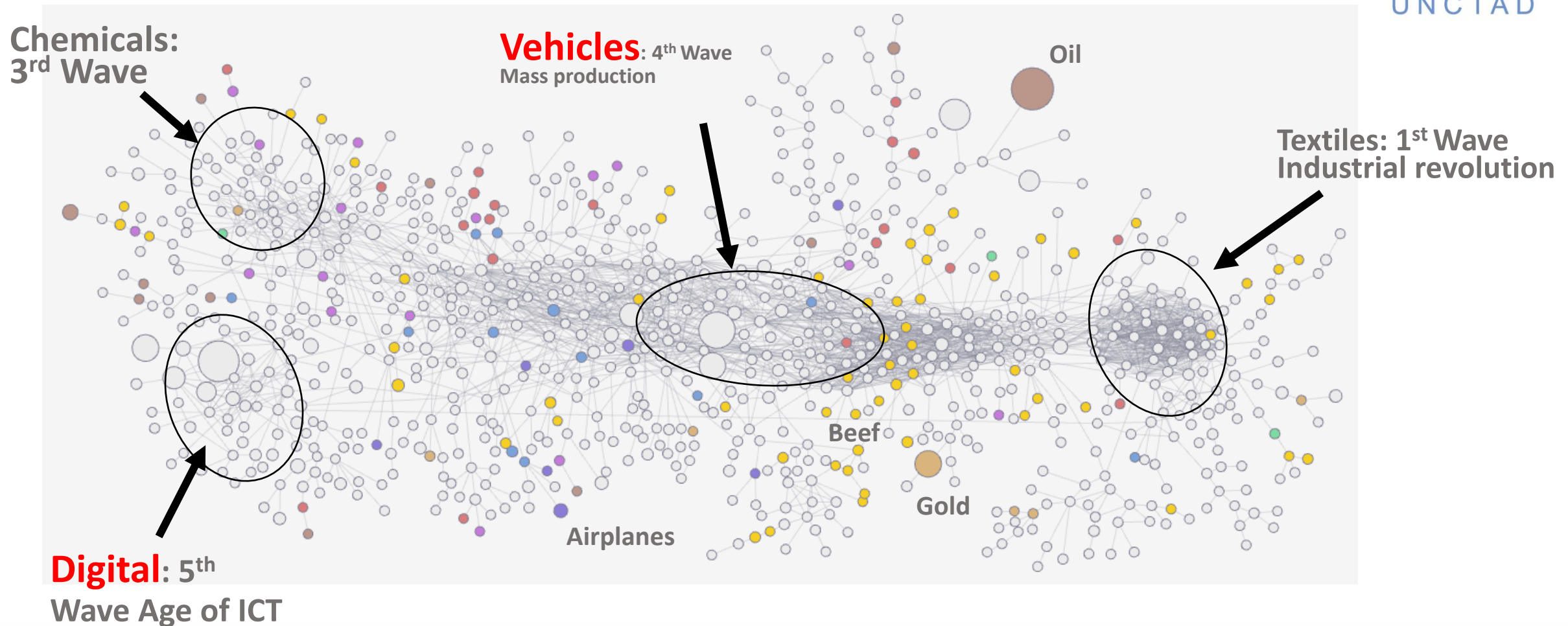
**FRONTIER TECHNOLOGY MARKETS ARE EXPECTED TO GROW RAPIDLY**

Market size estimates of Frontier technologies, \$billions



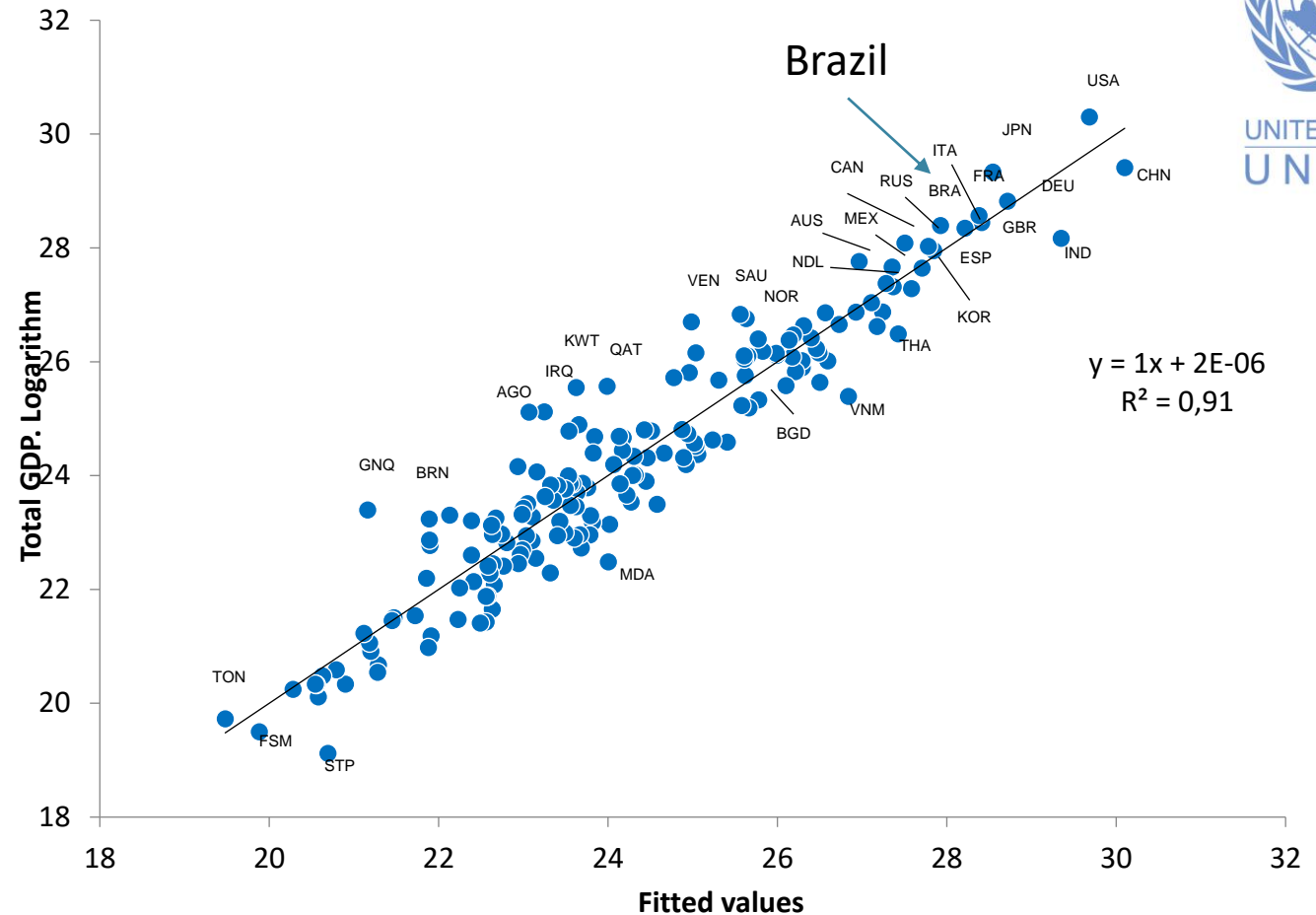
Source: UNCTAD based on data estimates from Froese (2018), MarketsandMarkets (2018), Sawant and Kakadee (2018), Business Wire (2019), Chaudhary et al. (2019), GlobeNewswire (2019b), MarketsandMarkets (2019), MarketWatch (2019a), MarketWatch (20191), Raza (2019), Tewari and Baul (2019), Wagner (2019b), Mordor Intelligence (2020a).

# TECHNOLOGICAL CHANGE MOVES OVER TIME FROM CORE SECTORS TO MORE TRADITIONAL SECTORS



Product space showing products connected to each other based on the likelihood of they being exported together

GROWTH-ENHANCING  
STRUCTURAL  
TRANSFORMATION  
REQUIRES  
ECONOMIC  
DIVERSIFICATION +  
COMPLEXITY  
WHICH ARE THE RESULT OF  
INNOVATION  
(NEW PRODUCTS &  
UPGRADE)



Diversification & Average Complexity & Size of labour force explain **91%** of differences in **total GDP** between countries

# A COUNTRY READINESS INDEX

Readiness towards the use, adoption and adaptation of frontier technologies, selected countries

| Country name  | Total ranking | ICT ranking | Skills ranking | R&D ranking | Industry ranking | Finance ranking |
|---|---------------|-------------|----------------|-------------|------------------|-----------------|
| <b>Top 10</b>                                       |               |             |                |             |                  |                 |
| United States of America                            | 1             | 14          | 17             | 2           | 20               | 2               |
| Switzerland   | 2             | 7           | 13             | 13          | 3                | 3               |
| United Kingdom                                      | 3             | 17          | 12             | 6           | 11               | 14              |
| Sweden  | 4             | 1           | 7              | 16          | 15               | 16              |
| Singapore   | 5             | 4           | 9              | 18          | 4                | 18              |
| Netherlands   | 6             | 6           | 10             | 15          | 8                | 23              |
| Korea, Republic of                                  | 7             | 19          | 27             | 3           | 9                | 8               |
| Ireland   | 8             | 24          | 6              | 21          | 1                | 87              |
| Germany   | 9             | 23          | 16             | 5           | 10               | 39              |
| Denmark   | 10            | 2           | 4              | 25          | 21               | 5               |
| <b>Selected transition and developing economies</b> |               |             |                |             |                  |                 |
| China   | 25            | 99          | 96             | 1           | 7                | 6               |
| Russian Federation                                  | 27            | 39          | 28             | 11          | 66               | 45              |
| Brazil  | 41            | 73          | 53             | 17          | 42               | 60              |
| India   | 43            | 93          | 108            | 4           | 28               | 76              |
| South Africa  | 54            | 69          | 84             | 39          | 71               | 13              |

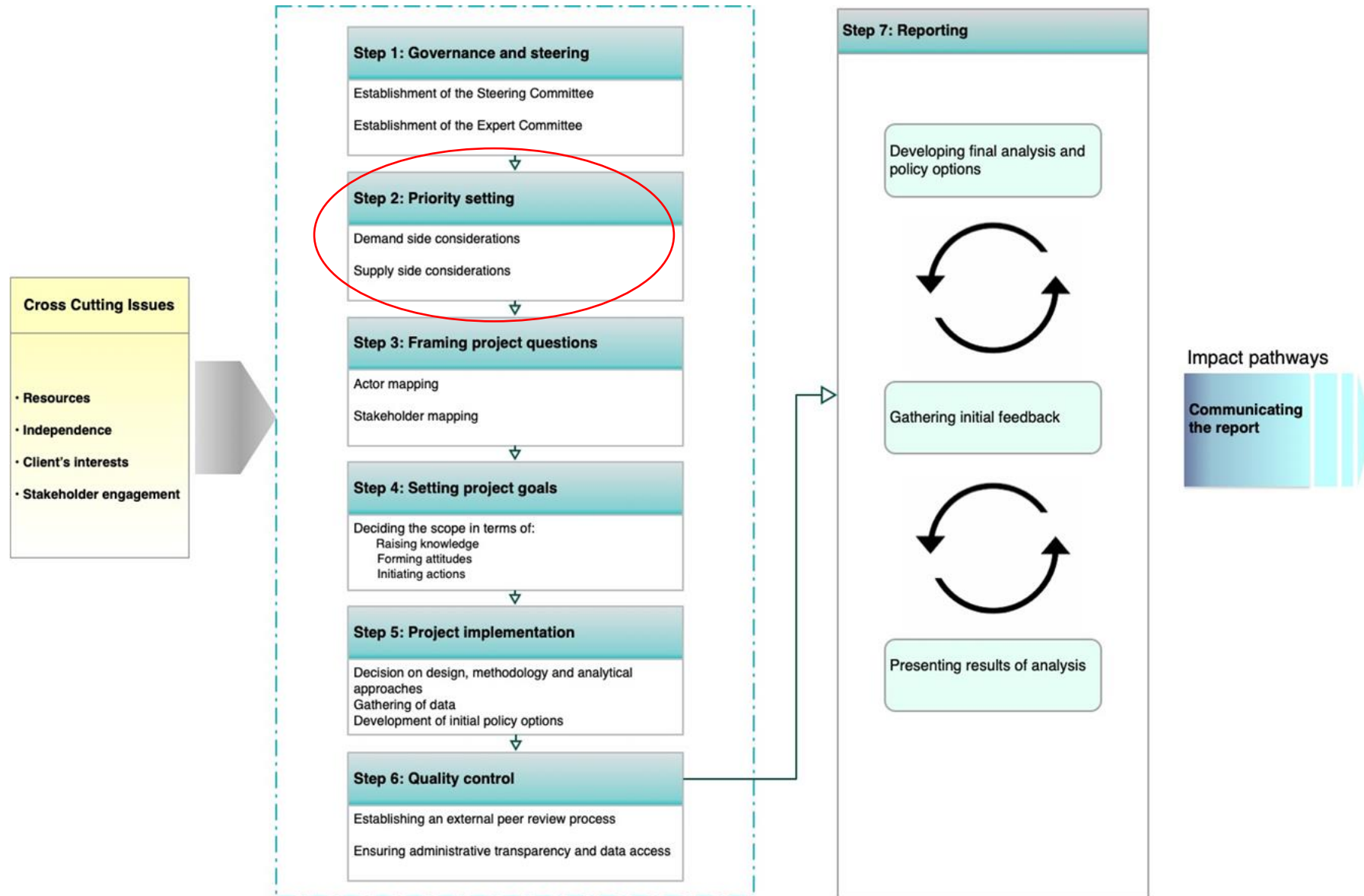
Source: UNCTAD (see the complete table in Statistical Appendix. Readiness for frontier technologies index).



# Technology Assessment (TA)

- Scientific, interactive and communicative
- Contribute to the formation of public and political opinion on societal aspects of science and technology
- Policy research on short- and long-term consequences of the application of technology
- Impacts of TA
  - Raising knowledge
  - Forming opinion among policy makers
  - Initializing actions by them

# TA – Step by step: Overview



# Supply-side considerations

- Which technologies / innovations are emerging in other parts of the world?
- Which may affect, positively or negatively, the efforts of the respective country to achieve the SDGs?



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# Further Reading

- UNCTAD (2021): Catching Technological Wave: Innovation with Equity. [https://unctad.org/system/files/official-document/tir2020\\_en.pdf](https://unctad.org/system/files/official-document/tir2020_en.pdf)
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- United States Government Accountability Office (2016). GAO technology readiness assessment guide. <https://www.gao.gov/products/gao-16-410g>