



Scenario dimensions

I Policy

1.1 Carbon Pricing

- CO2 tax (economy-wide, manufacturing sector)
- CO2 price equivalent for agriculture and LULUCH

1.2 Climate finance,

- Financing model of massive renewable scale up (export in developing countries)
- finance of infrastructure investments
- just transition fund
- financial transfers via CO2 permit allocation

1.3 Fiscal Policy

- Possibilities: subsidies for new technologies
- Stop subsidies fossil fuels and agriculture
- Revenue recycling

1.4 Trade Policy

- Carbon border adjustment mechanisms
- Green trade agreements
- Increase in international protectionism (climate policy with no/low trade vs. open economy)

II Structural/technological change

1. Agricultural sector

- Remove subsidies for intensive (quantity-oriented) cultivation (land degradation and nitrate discharge to groundwater)
- Subsidies for sustainable agricultural production (less emissions due to less fertilizer and less land use change, SDG)
- Variation of land productivities (yield rates); reduction due to climate damages
- Diet shifts from meat to plant based (consequences for meat/dietary industry)

2. Industry/Manufacturing sector

- Deindustrialization + urbanization
- Premature deindustrialization (India, other DCs)
- Coal phase out

- Circular economy (chemical industry: single use plastic ban
<https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/energy-outlook/bp-energy-outlook-2019-presentation-slides.pdf>)

3. Service sector

- Technology sharing for energy + infrastructure development
- Digitalization → expansion of advanced low-energy industry and services (contributes to productivity gains in other sectors)
 - i. Reallocation of labor
 - ii. New business areas
 - iii. gamechanger technologies?
 - iv. Changed energy demand

Digitalization potentially increases emissions due to higher energy demand by servers (Netflix etc.); decentralized location of servers supports renewable power supply and may result in emission reduction (Assessments of respective areas of digitalization: AI, Cloud computing (computation server) vs MobileApps/StreamingServices (storage server, share of energy for bringing service to the user probably rather high (central servers are more storage servers than computation servers))

- E-mobility → dampens electricity reduction in total

4. Growth and macroeconomy

- Options for the reallocation of labor after structural change (what skills do people have? where else could they be used?)
- GDPpc convergence (differentiated growth, secular stagnation)
- Extreme events lower physical and human capital

5. Technology and innovation

- CO2 intensive “transition” technologies/lock-ins → avoiding stranded assets (role of gas)
- For India/DCs: FDI and energy productivity
- Liberalization → global technology diffusion
- Natural sinks/“technological sinks”
- Availability of renewable energy
- Lack of acceptance by public (→ limits to renewable expansion → higher costs of climate policy)
- Home bias, preferences for domestically produced technologies, e.g. Indian policy-makers prefer domestic steam turbines against Chinese and Malaysian solar panels