

A strategic vision of (off-grid) electrification in decarbonization pathways

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Climate Paris Agreement

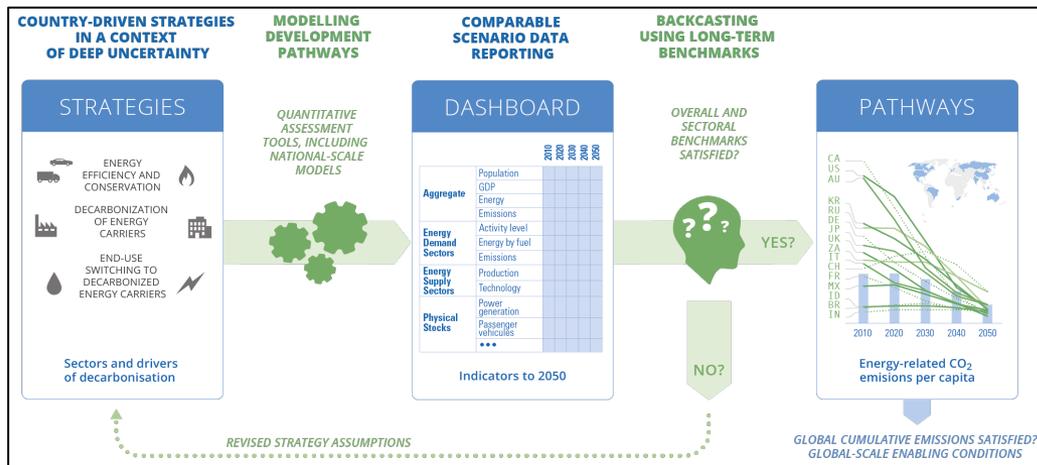
- Hold global temperature to “well below 2C/1.5C”
- Each country should define its own targets and measures
 - Nationally Determined Contributions to 2030
 - Long-term low-emission development strategies to 2050

IPCC 1.5 Report

- Carbon emission
 - Reduction by 20-45% in 2030 wrt 2010
 - Carbon neutrality by 2050-2070
- Requires massive systems change
 - 70-85% of renewable energy in electricity generation
- Synergies and tradeoffs with sustainable development objectives
 - Early action, coordination among actors, international cooperation

How to transform countries to achieve global carbon neutrality and satisfy local development needs, given national circumstances?

- ❑ IDDRI initiative to investigate this question in various countries, in collaboration with local research partners
- ❑ Raises methodological questions → how to connect ...
 - a country-driven vision framed by a global constraint
 - development priorities and carbon emissions
 - short-term actions and long-term trends



Waisman et al (2019) « A pathways design framework for national low greenhouse gas emission development strategies »

Nature Climate Change 9.4 (2019): 261-268

- ❑ Informing the content of transformations (beyond carbon emissions)
 - Electricity demand by sector and usage
 - Electricity generation potentials and installed capacity

- ❑ Informing the socio-economic impact of decarbonization
 - Start from development targets (electricity access, activity levels, other development objectives related to electricity)
 - Estimates of economic costs of electricity (investment vs variable)
 - Factor-in the non purely economic aspects (geographical and physical constraints; consumption patterns and lifestyles ...)

- ❑ Informing the consequences of short-term actions
 - Explicit description of equipments and infrastructure (+ lifetime)
 - Capture existing capital stock

- ❑ Select actions that maximize the synergies (and minimize the tradeoffs) between decarbonization and development priorities
- ❑ Identify the priority actions, policies and measures in the short-term (and those that should be avoided)
- ❑ Reveal the political economy aspects of the transition (risks of stranded assets, winners/losers) to anticipate challenges and risks
- ❑ Highlight the needs for international support to favor the emergence of cooperation mechanisms
- ❑ Favor alignment of actions from different players in the transition, by providing a common roadmap against which each actor can benchmark its activity