Demand-side assessments in Long-Term Energy Scenarios

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December 7th 2022
IEA drivers of scenario outcomes

It is important to understand drivers of model outcomes and emergent properties of energy system dynamics e.g.

Is Energy demand intensity to GDP an input or an output?

CO2 Intensity Vs Energy Demand

Percentage Difference from 2020
It is important to understand drivers of model outcomes and emergent properties of energy system dynamics e.g. Energy demand intensity?
Shared-Socioeconomic Pathways

IPCC Working Group 1, 2 & 3 coordinate their input assumptions by using the Shared Socio-economic Pathways (SSP) Narratives (SSPx-RCPx)
Data Source: https://tntcat.iiasa.ac.at/SspDb/dsd?Action=htmlpage&page=10
IEA Data Sources - WBIG

IEA publishes a comprehensive data base of global extended energy balances, that include all energy commodity flows within all NACE economic categories globally for ~147 countries – “WBIG” is the foundation of all global energy system models.
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More recently in the last 5 years or so IEA has put significant effort in also publishing harmonized macroeconomic, environmental and demographic data indicators for all regions on an annual basis.
IEA Data Sources **WBIG + WIND**

Linking the IEA WBIG and WIND databases by harmonized region names enables quick insights into historical dynamics of the energy system.
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Reminder – Energy access, Income, and Wellbeing go hand in hand

Total final energy consumption per capita (toe/capita) vs GDP per capita, 1960-2000
ML Extrapolation of IEA drivers

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THANK YOU!
Wind and Solar Installed Capacity

China far outpaces all other countries in cumulative installed capacity and recent rate of new capacity installation.

Global Top 10 Countries with Installed Wind Power Capacity

- China: 281,993 MW
- U.S.: 117,744 MW
- Germany: 62,184 MW
- India: 38,559 MW
- Spain: 27,089 MW
- UK: 24,485 MW
- France: 17,382 MW
- Brazil: 17,198 MW
- Canada: 13,577 MW
- Italy: 10,839 MW

Global Top 10 Countries with Installed Solar PV Capacity

- China: 253,834 MW
- U.S.: 73,814 MW
- Japan: 68,665 MW
- Germany: 53,781 MW
- India: 38,983 MW
- Italy: 21,594 MW
- Australia: 17,342 MW
- Vietnam: 16,504 MW
- Korea: 14,575 MW
- UK: 13,462 MW

Source: IRENA & CETO2022
IPCC 6th Assessment Report Decarbonisation Pathways

Projected global GHG emissions from NDCs announced prior to COP26 would make it likely that warming will exceed 1.5°C and also make it harder after 2030 to limit warming to below 2°C.

Modelled pathways:
- Trend from implemented policies
- Limit warming to 2°C (>67%) or return warming to 1.5°C (>50%) after a high overshoot, NDCs until 2030
- Limit warming to 2°C (>67%)
- Limit warming to 1.5°C (>50%) with no or limited overshoot
- Past GHG emissions and uncertainty for 2015 and 2019 (dot indicates the median)

Policy assessments for 2030:
- Policies implemented by the end of 2020
- NDCs prior to COP26, unconditional elements
- NDCs prior to COP26, including conditional elements

Percentile:
- 95th
- 75th
- Median
- 25th
- 5th
Thank You