

# Energy and Sectoral Transitions in the Context of the Paris Agreement

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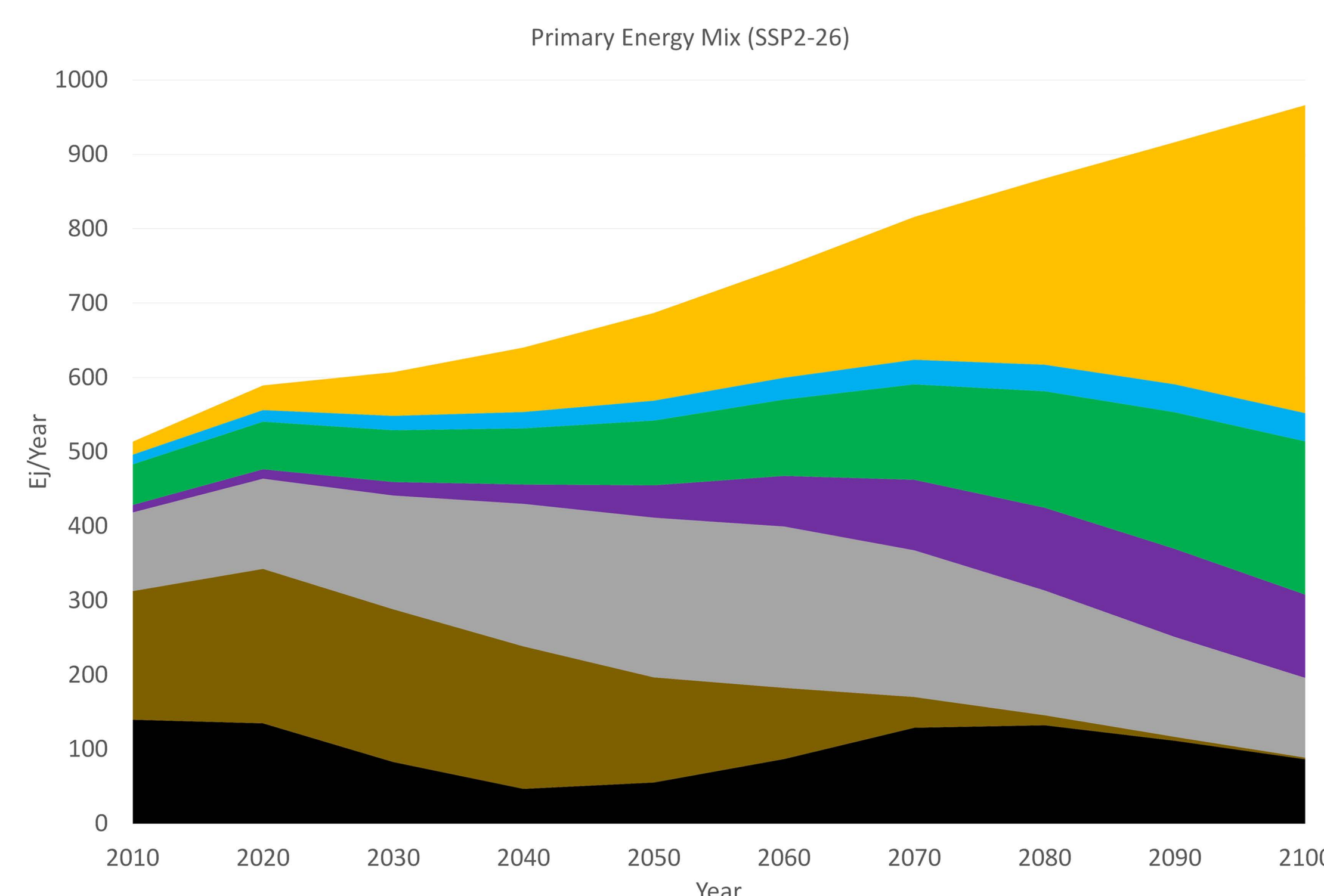
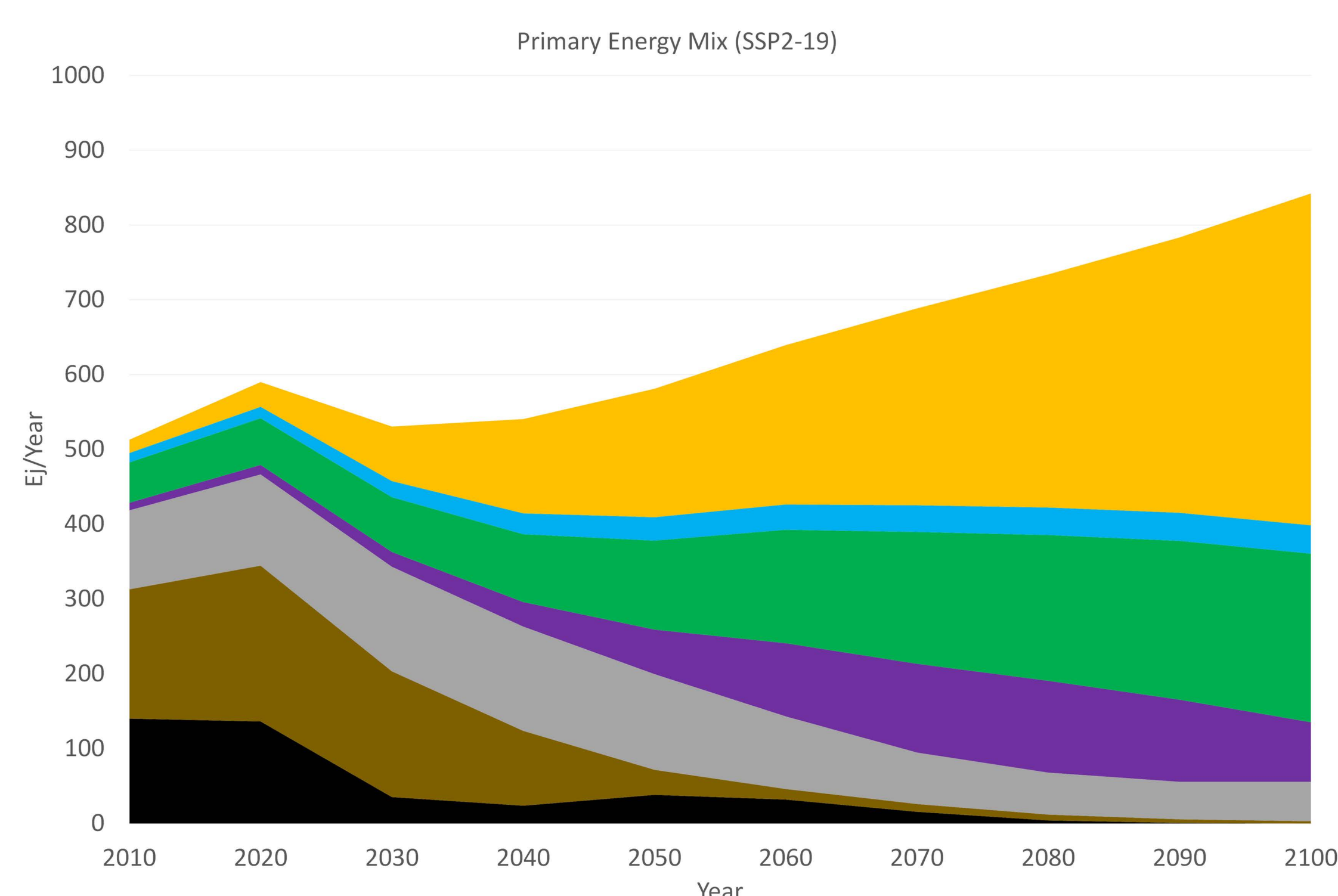
## The Paris Agreement and System Transitions

The long-term temperature goal in the Paris Agreement is to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C. Parties aim to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases (“net zero”) in the second half of this century. These imply rapid and far-reaching transitions in energy, land, urban and infrastructure, and industrial systems.

## What Does an Energy Transition Entail?

A transition is the process of changing from one state or condition to another over a given period of time. Transitions can take place at all scales, and can be incremental or transformative. Meeting the Paris Agreement long-term temperature goal implies long-term structural change in energy systems. These would be unprecedented in terms of scale and imply deep emissions reductions, a wide portfolio of mitigation options and a significant upscaling of investments.

## Energy Supply in Illustrative Energy Transition Scenarios



1. Regardless of the level of climate ambition, a transformation of the global energy system is implied
2. Energy demand increases over the 21st century
3. Biomass and other forms of renewable energy substitute for fossil fuels
4. The greater the level of climate ambition, the earlier and more rapid the transition

Note: Illustrative scenarios derived from the MESSAGE-GLOBIOM Model; both scenarios based on Share Socio-Economic Pathway 2 (SSP2); 1.5°C scenario linked to Representative Concentration Pathway 1.9 (RCP1.9); 2°C scenario linked to RCP2.6

## Research Priorities for System Transitions

- Strengthening sectoral decarbonisation strategies in the industry, buildings, and transport sectors
- Representing the financial sector in system models
- Role of regulatory financial institutions and their role in underpinning mitigation efforts
- Interactions between mitigation responses and sustainable development
- Carbon dioxide removal (CDR): responses other than BECCS and afforestation
- Emissions reduction potential of behavioural mitigation options
- Enabling change in organizations and political systems
- Methods for assessing the contribution and aggregated impact of non-state actors
- Land-use planning in cities, especially where tenure and land zoning are contested
- Multilevel governance, in particular in developing countries, including participation by civil society, women and minorities

## How Can Social Science Help?

- Improved relevance, assessment and communication of existing social science
- Integrate complementary insights from different social sciences, e.g. psychology, sociology, political science etc.
- “Systematic Review” of Literature
- Applied social science to help us understand “what works”, e.g. through post-evaluation of policy responses, policy learning
- Communicate in language that policymakers can understand

*IPCC AR6 Working Group III is attempting to push the envelope with a chapter on demand, services and social aspects of mitigation, piloting systematic review techniques.*

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