

# Modelling Global Energy Demand

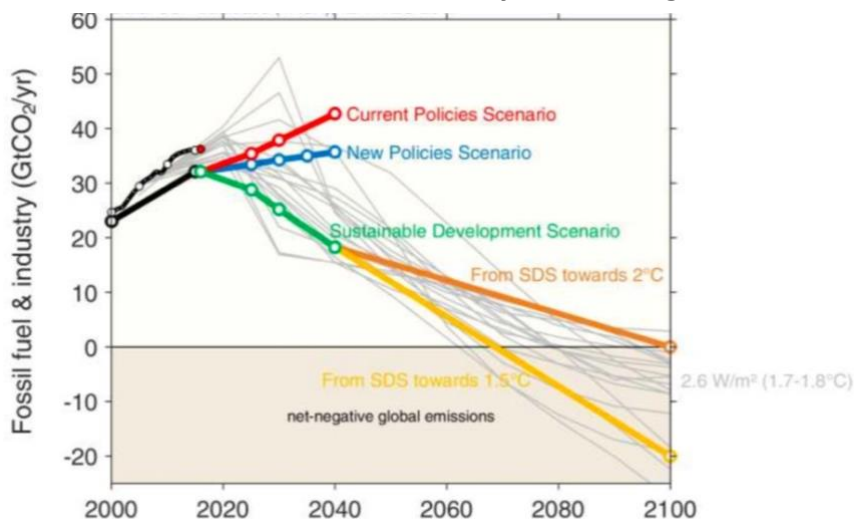
## Using International Climate Change Scenarios

Each year, the International Energy Agency (IEA)<sup>1</sup> releases the [World Energy Outlook \(WEO\)](#) which, among other things, [models](#) global energy demand using various [scenarios](#). The scenarios are not predictions, rather tools to assess risks. The scenarios respond to global [Paris Agreement](#) targets aimed at keeping temperature rises to well below 2°C while collectively pursuing efforts to limit increases to 1.5°C.

In limiting climate change to well below 2°C of warming, fossil fuel extraction must rapidly decrease towards zero net emissions, effective immediately. All countries must instead accelerate reliance on sustainable, affordable and renewable non-fossil sources of energy to avoid catastrophic climate change.

**IEEFA sees the IEA's Sustainable Development Scenario (SDS) as the most likely reflection of the world's energy future.** Global financial institutions exiting coal are generally committing<sup>2</sup> to the IEA's SDS or Beyond 2°C Scenario when they set Paris Agreement compliant targets.

### Possible Carbon Emissions Pathways Reflecting IEA Scenarios



Source: Glen Peters, IEA WEO 2017, SS database (IIASA)P.<sup>3</sup>

The [Sustainable Development Scenario \(SDS\)](#) presents a realistic, desirable scenario in terms of human and global safety whereby nations work together to successfully limit climate change by transforming the energy market. Under the SDS, the planet's 'carbon budget' will be exhausted as early as 2023 under a 1.5°C target and by 2040 under a 2°C objective. The SDS projects a significant decline in thermal coal demand, with global

<sup>1</sup> The IEA is an independent intergovernmental organisation established in 1974 under the OECD.

<sup>2</sup> See IEEFA, [Over 100 Global Financial Institutions Are Exiting Coal, With More to Come Every Two Weeks a Bank, Insurer or Lender Announces New Restrictions on Coal](#), 27 February 2019.

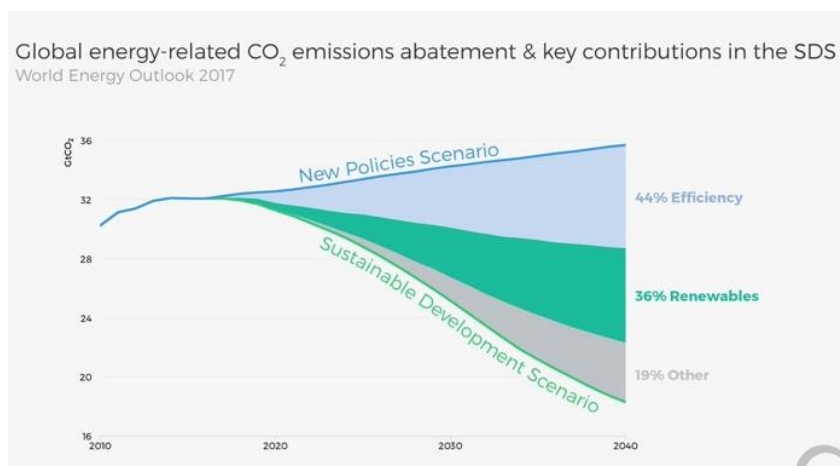
<sup>3</sup> Centre for International Climate Research (CICERO), [Beyond Carbon Budgets and Back to Emissions Scenarios](#), Glen Peters, September 2018.

## Modelling Global Energy Demand

---

trade plummeting 59% by 2040. The SDS falls short of meeting the Paris Agreement's target with any certainty, given the presumption that coal carbon capture and storage (CCS) is commercialised at scale by 2030. IEEFA sees this as an improbable assumption absent a high price on carbon emissions.

### Global Energy-Related CO<sub>2</sub> Emissions Abatement and Key Contributions in the SDS



Source: International Energy Agency.<sup>4</sup>

The **Beyond 2°C Scenario** (B2DS) sets out a rapid decarbonisation pathway aligned with international goals. To achieve net-zero emissions by 2060, technological innovation is heavily invested in and deployed across the energy system consistent with a 50% chance of limiting average future temperature increases to 1.75°C. The B2DS falls within the Paris Agreement range of ambition without defining a specific temperature target.

The **66% 2°C Scenario** models global policies that give the world a 66% chance to meet the <2°C Paris target through an unparalleled ramp up of all low-carbon technologies and the 'rapid phase-out of fossil fuel subsidies', including massive increases in carbon pricing and 'extensive energy market reforms' and mandates. 66% 2°C projects the fastest structural decline for the thermal coal industry and offers a more definite chance of meeting the Paris Agreement target.

The **New Policies Scenario** (NPS) models emissions continuing to rise until 2040 with global temperatures likely increasing more than 2.7°C by mid-century. The NPS assumes countries collectively will *not* take significant action to act on carbon emissions in line with 'ratchet-up' commitments in the Paris Agreement. Under the NPS, global coal trade declines 5% by 2040.

The **Current Policies Scenario** (CPS) assumes no effective concerted action on climate with the globe's carbon dioxide levels continuing to increase and the global warming target of 1.5°C exceeded by 2022. By definition, the CPS is consistently out-of-date as policies and measures since mid-2018 are not included.

---

<sup>4</sup> International Energy Agency [World Energy Outlook 2017](#).