2019 Report

The Production Gap The discrepancy between countries' planned fossil fuel production and global production levels consistent with limiting warming to 1.5°C or 2°C







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# **About This Report**

This report is the first assessment of countries' plans and outlooks for fossil fuel production, and what is needed to align this production with climate objectives. It follows in the footsteps of the United Nations Environment Programme's (UNEP) *Emissions Gap Report* and other reports that review countries' greenhouse gas emissions and compare them with the emission levels needed to meet global climate goals.

The report represents a collaboration of several research and academic institutions and experts. UNEP staff provided guidance and insights from their experience leading other gap reports. Assessment of the production gap was based on the most recent and publicly accessible government plans and projections for fossil fuel production at the time of analysis. For other elements of the report, such as the magnitude of producer subsidies or the status of policies to limit production, the report draws from a mix of publicly available government, intergovernmental, and research sources as cited and listed in the references.

As this is the first report of its nature, we welcome feedback and suggestions. Contact info@productiongap.org

### Citation

This document may be cited as: SEI, IISD, ODI, Climate Analytics, CICERO, and UNEP. (2019). The Production Gap: The discrepancy between countries' planned fossil fuel production and global production levels consistent with limiting warming to 1.5°C or 2°C. http://productiongap.org/

A digital copy of this report along with supporting appendices is available at http://productiongap.org/

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P. 49: Bonn Climate Change Conference, May 2017. Photo by IISD/Kiara Worth (enb.iisd.org/climate/sb46/enb/8may.html). All other photos: Getty Images.

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# Foreword

# In 2009, the UN Environment Programme released the first *Emissions Gap Report*, an

assessment of the global community's plans for mitigating climate change. In the decade since, countries have made new rounds of commitments



through the Paris Agreement. However, carbon emissions have remained exactly at the levels projected a decade ago, under the business-as-usual scenarios used in Emissions Gap Reports.

This calls for a sharpened, and long overdue, focus on fossil fuels. The world's energy supply remains dominated by coal, oil and gas, driving emission levels that are inconsistent with climate goals. To that end, this report introduces the fossil fuel production gap, a new metric that clearly shows the gap between increasing fossil fuel production and the decline needed to limit global warming.

By bringing coal, oil, and gas outlooks in line with climate goals, governments can round out their climate plans and better position themselves to achieve emission reductions. This report helps start that conversation, with a set of tools for assessing and closing this important gap in climate policy.

Inger Andersen Executive Director United Nations Environment Programme



The Stockholm Environment Institute is entering its 30th year of informing sciencebased climate action. In that time, we've seen important strides to improve energy efficiency, deploy renewables, and price carbon. But in recent



years, we've also helped sound the alarm about how those successes have not translated into lower global emissions.

A key reason for this paradox is that major coal, oil, and gas projects have simultaneously continued to attract investment, receive public permits, or otherwise enjoy government support. This undercuts efforts, sometimes by these same governments, to reduce emissions.

There is a need to quantify, track, and address this disconnect. The fossil fuel production gap introduced in this report demonstrates clearly that governments' collective plans and projections for future fossil fuel production are incompatible with a safe climate.

The good news is that a host of policy solutions are available. Some countries — as well as subnational governments, businesses, investors, and trade union and civil society organizations — are already beginning a just transition away from fossil fuel production. Others must now follow their lead.

Min Nily

Måns Nilsson Executive Director Stockholm Environment Institute



# Glossary

### **Carbon entanglement**

The process by which government dependence on fossil fuel extraction creates heavily vested interests in bringing fossil fuels to market that stand in the way of progress in climate policy (Gurría 2013).

### **Carbon lock-in**

The tendency for certain carbon-intensive technological systems to persist over time, 'locking out' lower-carbon alternatives, owing to a combination of linked technical, economic, and institutional factors. These technologies may be costly to build, but relatively inexpensive to operate (Erickson et al. 2015).

### **Emissions** gap

The difference between the greenhouse gas (GHG) emission levels consistent with a specific probability of limiting the mean global temperature rise to below 2°C or 1.5°C in 2100 above pre-industrial levels and the GHG emission levels consistent with the global effect of the nationally determined contributions, assuming full implementation from 2020 (UNEP 2018).

# Extraction-based emissions accounting

An accounting framework that attributes GHG emissions from the burning of fossil fuels to the location of fuel extraction.

#### **Fossil fuel production**

A collective term used in this report to represent processes along the fossil fuel supply chain, which includes locating, extracting, and processing, and delivering coal, oil, and gas to consumers.

#### **Green paradox**

The phenomenon whereby fossil fuel producers may be incentivized to accelerate production in the near-term under the expectation of increasingly stringent demand-side policies (Hoel 2013; Sinn 2012).

#### **Greenhouse** gases

Atmospheric gases that absorb and emit infrared radiation, trap heat, contribute to the greenhouse effect, and cause global warming. The principal GHGs are carbon dioxide ( $CO_2$ ), methane ( $CH_4$ ) and nitrous oxide ( $N_2O$ ), as well as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6).

# Integrated assessment models (IAMs)

Models that combine knowledge from multiple disciplines and are used to explore how social and economic factors and choices interact with the natural environment.

#### **Just transition**

In the context of climate policy, this refers to a shift to a low-carbon economy that ensures disruptions are minimised, and benefits maximised, for workers, communities and consumers who may be disproportionately affected (ITUC 2017; UNFCCC 2016).

### Long-term low GHG emission development strategies (LEDS)

Under the Paris Agreement and its accompanying decision, all countries are invited to communicate LEDS, taking into account their common but differentiated responsibilities and respective capabilities, in the light of different national circumstances, by 2020.

# Multilateral development bank (MDB)

An international financial institution chartered by multiple countries to support economic and social development in lower-income countries.

#### Nationally determined contributions (NDCs)

Submissions by Parties to the Paris Agreement that contain their stated ambitions to take climate change action towards achievement of the Agreement's long-term goal of limiting global temperature increase to well below 2°C, while pursuing efforts to limit the increase to 1.5°C. Parties are requested to communicate new or updated NDCs by 2020 and every five years thereafter.

# National fossil fuel production plans and projections

Fossil fuel production targets, plans, and projections drawn from national plans, strategy documents, and outlooks published by governments and affiliated institutions.

#### **New Policies Scenario (NPS)**

A widely-used scenario from the International Energy Agency's 2018 World Energy Outlook that reflects countries' climate policies and ambitions announced as of August 2018 towards the achievement of their NDCs. The NPS is nearly identical to the IEA's estimate for full implementation of NDCs (as submitted in 2015) in terms of future global CO<sub>2</sub> emissions from fossil fuels (IEA 2018a).

### Non-state and subnational actors

Regions, cities, investors, companies, civil society, individuals, and other actors, beyond national governments, that may play a role in taking climate action.

### **Production** gap

The discrepancy between countries' planned fossil fuel production and global production levels consistent with limiting warming to 1.5°C or 2°C.

#### **Resource curse**

Refers to the fact that many resourcerich countries do not fully benefit from their natural resource wealth, and may in fact experience worse development and economic growth outcomes than countries with fewer natural resources (Sachs and Warner 1995).

### Stranded assets

Assets that suffer from unanticipated or premature write-offs, downward revaluations or are converted to liabilities, as the result of a low-carbon transition or other environment-related risks (Ansar et al. 2013).

### Subsidy

A financial benefit accorded to a specific interest (e.g. an individual, organization, company, or sector) by a government or public body.

#### Supply-side climate policy

Policies and measures aimed at regulating or managing the wind-down of, or transition away from, fossil fuel production.

#### Territorial emissions accounting

The standard accounting framework that attributes GHG emissions from the burning of fossil fuels to the entity or location where the fuels are burned.

# **Abbreviations**

Bcm	Billion cubic meters
BECCS	Bioenergy with carbon capture and storage
CDR	Carbon dioxide removal
<b>CO</b> <sub>2</sub>	Carbon dioxide
СОР	Conference of the Parties to the UNFCCC
°C	Degree Celsius
EJ	Exajoule
ETS	Emissions Trading System
G20	Group of Twenty
GHG	Greenhouse gas
Gt	Gigatonne (Billion tonnes)
IAM	Integrated assessment model
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
LEDS	Long-term low greenhouse gas emission development strategies
Mb/d	Million barrels per day
MMBtu	Million British Thermal Units
Mt	Million tonnes
NDC	Nationally determined contribution
NPS	New Policies Scenario
OECD	Organisation for Economic Co-operation and Development
OPEC	Organization of the Petroleum Exporting Countries
PPCA	Powering Past Coal Alliance
SDG	Sustainable Development Goal
UNEP	United Nations Environment Programme
UNFCCC	UN Framework Convention on Climate Change
WTO	World Trade Organization



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