

# Sticking with natural gas will lead to power generation losses of \$1 trillion by 2050

FORECAST AND ECONOMIC REPORT FROM RETHINK ENERGY



**Companies mentioned in this report:** Ansaldo Energia; Carbon Tracker; Chubu Electric; Consumers Energy; Drax; DTE Energy; Electric Reliability Council of Texas (ERCOT); European Investment Bank; European Union; GECF; General Electric; Intergovernmental Panel on Climate Change; International Energy Agency; New Energy and Industrial Technology Development Organization (Japan); JERA; Kansai Electric; KEPCO; Midcontinent Independent System Operator (MISO); Mitsubishi Hitachi; Mitsui & Co.; Northern Indiana Public Service Company; OPEC+; PJM Interconnection; Shell; Siemens AG; Siemens Gamesa; Siemens Power and Gas; TEPCO; TC Energy; Tohoku Electric Power; Toshiba; University of Stanford; US Energy Information Administration (EIA); Xcel Energy

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Lead analyst: Harry Morgan

## Executive Summary

*“Rethink has a commitment to forecasting markets that others shy away from – those on the verge of radical transformation”*



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## Introduction

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Natural gas can no longer be used as a 'bridge' fuel for electricity production in the route to net-zero emissions – and current levels of investment will lead to devastating losses in both an economic and environmental sense.

Recent years have seen the market for coal crumple, while oil has more recently been crushed through coronavirus. As the cost of renewables-plus-storage will continue to fall with economies of scale, the fossil-fuel glut will see the gas sector fall to the same fate – far before it can provide any assistance in global decarbonization.

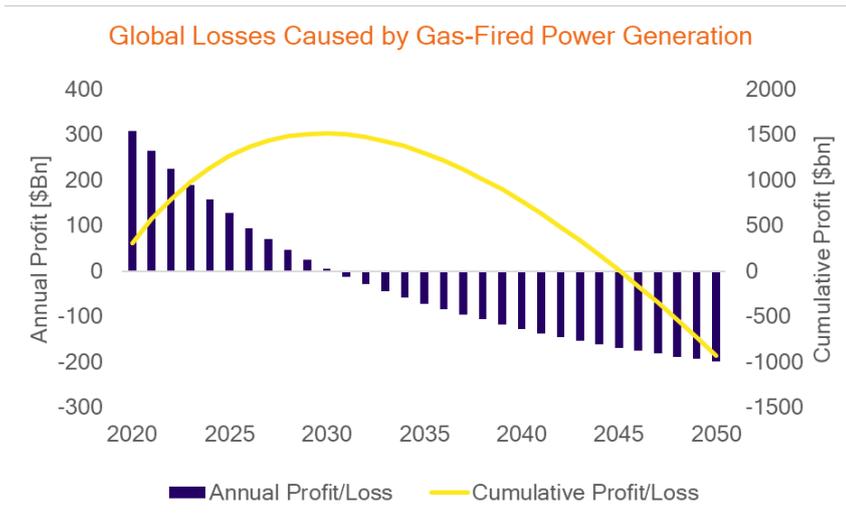
With the current lack of ambition to tackle climate change, alongside current levels of investment, today's decision to choose natural gas over renewables-plus-storage for electricity generation will see \$X.X trillion wasted across the world's largest economies by 2050.

Over the lifetime of the gas-fired turbines being installed today, renewable energy portfolios with the necessary levels of storage will fall in cost such that if the equivalent capacity of renewables were installed instead, both the economic and environmental benefits would be overwhelming.

From 2025 onwards, renewables-plus-storage projects in both wind and solar will undercut the levelized cost of energy of new gas-fired power plants, starting in Europe and Asia, before spreading to gas-producing nations. Perhaps more staggeringly, these projects will undercut the cost of operation of existing gas plants from 2030: a reality that will exist in all markets before 2050 – with today's installed gas assets left stranded.

With high gas prices and levels of renewable penetration as well as progressive carbon taxation, these losses will be greatest in Europe – which risks \$518 billion in stranded assets by 2050, ahead of the US (\$XXX billion), Japan (\$XXX billion), China (\$XXX billion) and South Korea (\$XX billion).

Gas producing countries including Mexico, Egypt, Iran, Russia and Saudi Arabia will not have incurred any cumulative losses by this time, due to cheap supply and low levels of climate ambition. However, these will also be making net-losses year-on-year of up to \$X.X billion, and gas turbines installed in the next 5 years are likely to be closed ahead of schedule to limit economic damage or high electricity prices being passed on to consumers. Pressure from other countries will eventually raise the climate ambition in these regions, and accelerate the demise of gas.



This is the route we expect to be taken on an international scale. As soon as losses are apparent, progressive oil and gas majors will try to offload their assets by divesting to those who think they can squeeze some last-gasp profits out of projects – probably by cutting safety and transparency measures. This will start with gas peakers before shifting to more efficient plants and suppliers which can promise carbon capture technology.

While there is still some near-term profit to be had out of gas-turbines ahead of 2025, we’ll start seeing this process from 2023 at the latest, as investors start to come round to the idea that through the asset’s life, huge losses will be incurred.

The way that the gas sector can survive is through the immediate investment in clean power generation. This must be heavily biased towards renewables and green hydrogen, rather than biogas or carbon capture, utilization and storage (CCUS).

While there may be a place for both of these latter technologies to some extent, a large-scale buildout of biomass cannot be agriculturally sustained. The EU’s current biomass plans would require 2,700 square kilometers of forest to be replaced every year, only to produce X% of the region’s electricity. Similarly, CCUS technology has so far only man-

aged to remove as little as XX.X% of CO<sub>2</sub> emissions, while adding XX% onto original power consumption at a plant level, as well as a XXX% increase in capital expenditure. Pursuing CCUS as a key part of the energy transition also risks increasing the level of stranded assets by as much as XXX%, with neither technical improvement or cost reduction within the technology able to compete with advances in renewable power generation or energy storage.

Green hydrogen however provides the potential to convert existing gas turbines into a form of dispatchable and clean power generation. While current turbines can operate with a X% to X% composition of hydrogen, it is imperative that the industry pushes for this to rise to XXX% by 2030 at the latest, by offering pressure and rewards to manufacturers.

The LCOE of renewables-plus-storage will fall at an average compound annual growth rate (CAGR) of X.X% over the next 30 years, and by 2050 we're likely to see solar-plus-battery costs in the region of \$XX per MWh.

In this time the cost of gas will have risen across most major economies, with the LCOE of generation reaching \$XX per MWh in Europe. This will be driven by the following factors:

As renewable penetration increases, gas-fired power loses its preference in the electricity mix, and the utilization rate of each specific plant will decrease. For every X% decrease in the utilization rate in the XX% to XX% range, the LCOE of gas-fired power plants rises by between \$X.XX and \$X.XX per MWh.

Climate conditions will become more and more aligned with the Paris Agreement, with initiatives put in place to price emissions out of the market, especially in progressive economies. For every \$X per ton of CO<sub>2</sub> in carbon tax, the LCOE of gas-fired power plants rises by \$X.XX per MWh.

## Who should buy this report?

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This report is essential reading for anyone who advises on, influences or controls the selection of electricity generation. We consider it breakthrough work that will change the course of billions, if not trillions, of dollars.

If you are considering investing in gas turbine facilities, or making a case for doing so, or building an economic model for its output for the next 25 years, or if you work in an investment firm which offers debt to these markets, or a retail energy supplier, a regulated utility or an electricity generation equipment vendor, *you need to read this report*. And afterwards you need to take a long hard look at both your current strategy, and your strategy for the past 5 or ten years.

The timescale for all of this \$1.2 trillion to be reflected “in the share price” of existing companies, is just a handful of years, and you do not want to be the one that everyone is pointing at when they ask the question “Did you know about this?”

For the past decade Gas Turbines have increased their rate of installation around the world in the belief that they were the “natural” transition fuel from coal to sustainable energy. In some parts of the world the use of gas has been treated as if it were green and sustainable in its own right, when clearly it is not.

If energy companies do not change that view the moment they have read this report, they are in danger of putting their institutions under massive financial pressure in the future.

If you are at all unsure of whether or not to invest in this report, then please request **FREE** entry to our **WEBINAR** on this report on Tuesday May 19th at 4pm BST. Email Simon Thompson to request webinar access at [simon@rethinkresearch.biz](mailto:simon@rethinkresearch.biz)

## Forecasting investment possibilities across renewables

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Rethink Energy is our energy service, made up of our Weekly Analysis and our quarterly Tracking Services. These both include access to our deals database. We focus on the transition from fossil fuels, and take in Wind, Solar, Energy Storage, Hydrogen in the tracking services and our Weekly Analysis takes in more developments in things like the digitalization of the grid, the rise of EVs and recharging points. Our deals database is freely accessible to any customer and has over 2,500 live renewables deals.

**This Report** can be purchased as part of either our **Hydrogen Tracking Service** or our **Energy Storage Tracking Service**. **This is because** we see the demise of Gas for Power almost entirely replaced by either Green Hydrogen for Power or by Lithium Ion batteries.

Our quarterly tracking services show current installation counts and offers at least one forecast each year. We also provide details of technical advances, and changes to renewables policy by country, and access to the deals database.

**Previous forecasts are available to all news customers of the tracking services :**

- Energy Storage attached to 50% of solar installs by 2030
- Offshore Wind forecast; Offshore wind to drive 8m jobs, is key to decarbonization
- Floating Solar goes stratospheric once it partners with hydro

### SUBSCRIPTION PRICING

**Tracking services** are all \$1,500 for one person, or \$3,200 for a corporate license. There are volume discounts if you want more than one of the tracking services.

You may also wish to buy our Weekly Analysis, which costs;

**Single User license** - \$1,850

**5 User license** - \$3,000

**Corporate license** - \$4,500.

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## About Rethink Technology Research

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Rethink is a thought leader in quadruple play, renewable energy and 5G wireless. It offers consulting, advisory services, research papers, plus three weekly research services; Wireless Watch, a major influence among wireless operators and equipment makers; Faultline, which tracks disruption in the video ecosystem, and OTT video, Rethink Energy, which monitors investment opportunities in the changing energy landscape.



"Forecasting technology markets, whether they are growing or shrinking."

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