

The hidden cost of gas: Toxic emissions from Thailand's power sector

Jamie Kelly

Daniel Nesan

11/2025



CREA

CREA is an independent research organization focused on revealing the trends, causes, and health impacts, as well as the solutions to air pollution.

The hidden cost of gas: Toxic emissions from Thailand's power sector

November 2025

Authors

Jamie Kelly

Daniel Nesan

Editor

Jonathan Seidman

Acknowledgements

CREA gratefully acknowledges the support, feedback, and insight received from Greenpeace Thailand

The hidden cost of gas: Toxic emissions from Thailand's power sector

Key messages

- Thailand's operating and planned gas power plants release large volumes of toxic air pollutants — 33.4 kilotonnes (kt) of nitrogen oxides (NO_x), 1.7 kt of sulphur dioxide (SO_2), and 0.4 kt of fine particulate matter ($\text{PM}_{2.5}$) every year, once the planned plants are in operation.
- The majority of these gas plants are clustered around Bangkok, a densely populated city that suffers from major air quality issues, and the Eastern Economic Corridor, exposing millions of people to harmful air pollution.
- The NO_x emissions from Thailand's gas power plants exceed the combined emissions from buses, motorcycles, and taxis in Bangkok Metropolitan Region (25.9 kt).
- With domestic gas reserves in decline, growing dependence on imports, rising costs compared with renewables, and growing methane emissions, gas now threatens Thailand's energy security, economy, climate, and public health.

Contents

Key messages	1
Contents	2
The false promise of gas	3
Gas in Thailand's power mix	3
Gas: a fading promise	4
Energy insecurity	5
Economic burden	5
Climate contradiction	6
Potential contribution to toxic air	7
Results	8
Health and policy implications	10
Rethinking Thailand's energy pathway	11
Methodology used in this study	12
Appendices	13
Appendix A: Unit level results	13
References	19

The false promise of gas

Natural gas has long been promoted by power suppliers as Thailand's reliable, affordable, and cleaner alternative to coal (Stanley Center, 2020; Nation Thailand, 2025). Over the past two decades, it has become the backbone of the national power system, supplying nearly two-thirds of the country's electricity (Figure 1). Yet this dominance has come at a growing cost.

Today, the assumptions that power companies once used to justify expanding gas power no longer hold true. Domestic gas reserves are declining, import dependence is rising, and gas-fired electricity is becoming more expensive than renewable alternatives. Moreover, the supposed climate benefits of gas are eroded by methane emissions.

Beyond these economic and climate drawbacks, gas power plants are a source of toxic air pollution, an impact that has received far less attention but poses a direct threat to public health. This briefing presents new evidence on the scale and distribution of pollutant emissions from Thailand's gas power stations, revealing how the country's reliance on gas undermines both clean air and energy security.

Gas in Thailand's power mix

Over the past two decades, Thailand's electricity generation has become increasingly dominated by natural gas. As shown in Figure 1, gas-fired power generation grew from about 75 TWh in 2000 to 126 TWh in 2023 (IEA, 2025), and supplied 68 % of total electricity output in 2024 (EMBER, 2025a). This makes Thailand one of the most gas-dependent power systems in Asia.

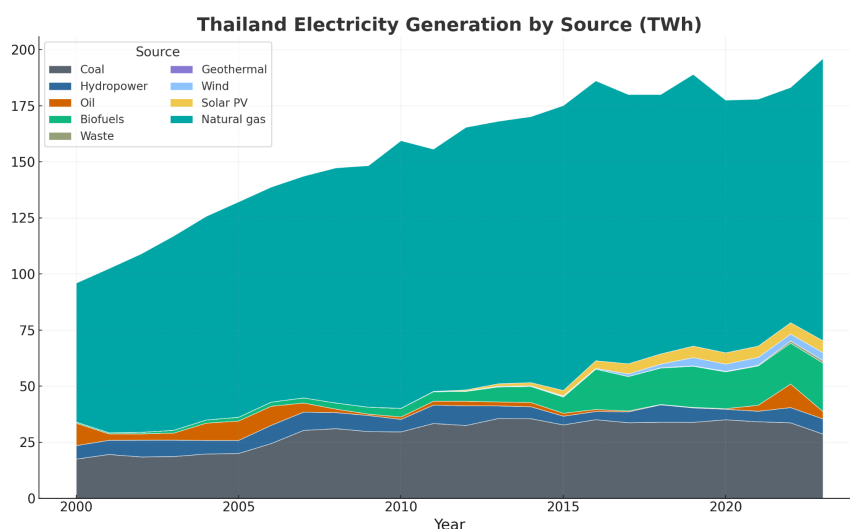


Figure 1 – Electricity generation across different sources across Thailand, taken and adapted from IEA (2025).

Gas became central to the country’s energy strategy because it was viewed as cheap, stable, and cleaner than coal. Domestic reserves discovered in the 1980s and 1990s offered a sense of self-sufficiency, while the fuel’s lower visible pollution reinforced its image as a “modern” option. Yet, despite rapid advances in renewable energy technology and sharp declines in solar and wind costs, Thailand has continued to expand its gas capacity. Consequently, the country has locked in new infrastructure and long-term supply contracts that will shape the energy mix for decades.

This heavy reliance on gas has far-reaching implications. It exposes Thailand’s economy to volatile global fuel markets, inflates electricity costs as LNG imports rise, and crowds out investment in renewable generation. Most importantly, it sustains a major source of toxic and climate-warming emissions that now threaten Thailand’s clean-air goals and its 2050 net-zero target (Thai Publica, 2025).

The cost of gas reliance

Natural gas was once seen by power companies as a cornerstone of Thailand’s secure and sustainable development (Stanley Center, 2020; Nation Thailand, 2025). It was expected to

deliver affordable power, shield the country from fuel price volatility, and offer a cleaner path to growth. Yet today, each of these claims is rapidly unraveling.

Energy insecurity

Domestic gas reserves in the Gulf of Thailand are in decline, and production has fallen sharply over the past decade. To fill the gap, data from the Office of Energy Policy and Planning (EPPO) reports that Thailand has become increasingly reliant on imports, including both pipeline gas from Myanmar, making up 9% of consumption, and liquefied natural gas (LNG) shipments, supplying 27% (EPPO, 2025). However, in 2023, pipeline gas imports from Myanmar dropped 21% compared to the previous year (S&P, 2024), while the share of LNG shipments is projected to reach 60% of consumption by 2025 (EMBER, 2025b).

This shift means that Thailand's power generation sector is increasingly exposed to global LNG price fluctuations and to upstream and geopolitical instability, undermining energy security and driving up power generation costs. During recent energy crises, LNG prices spiked to record highs - with LNG prices reaching 80 USD per million BTU in 2022 (Bangkok Post, 2025; Investing.com, 2025), forcing utilities to raise tariffs and straining household and industrial budgets. Far from providing stability, gas has become a source of economic vulnerability.

Economic burden

Gas-fired power is no longer the cheapest option. According to Bloomberg NEF (2025), in Thailand the levelized cost of electricity (LCOE)¹ for solar with battery storage is USD 79 per MWh in 2025, already below the USD 82 per MWh cost of gas. By 2030, combined solar and storage costs are projected to fall to USD 56 per MWh, while gas remains stuck at USD 79 per MWh. In other words, every new gas plant built today risks locking Thailand into higher electricity costs for years to come, while cheaper renewable alternatives go untapped. The lock-in is especially severe as much of Thailand's gas-fired power generation operates under long-term power purchase agreements (PPAs) lasting 20–25 years (Agora, 2025).

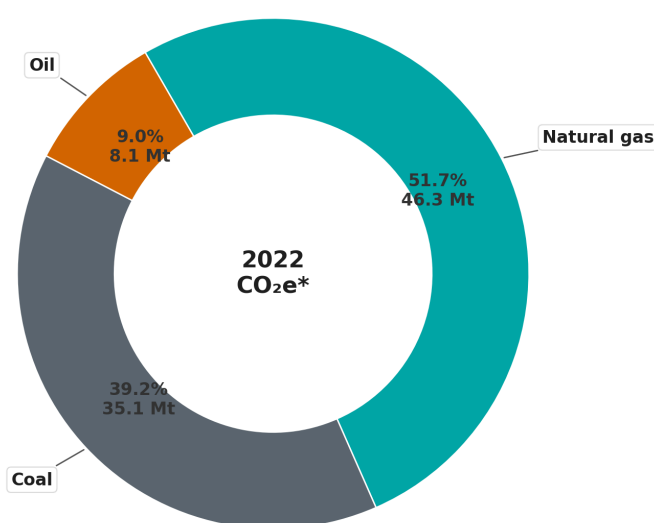
¹ Levelized Cost of Electricity (LCOE) is the average cost of producing one unit of electricity over the entire lifetime of a power plant. It adds up all the costs, such as building, fuel, maintenance, and operation, and divides them by all the electricity the plant will produce. This gives a single number that allows you to compare different energy sources (like solar, wind, coal, or gas), showing how much each actually costs to make electricity in the long run.

Climate contradiction

Gas has long been described as a “bridge fuel” to a low-carbon future. However, gas is a source of methane, which is a potent greenhouse gas. Methane is around 25 times more potent than CO₂ over a 100 year time horizon, meaning even small leakage rates erase the perceived advantage. Furthermore, its climate impact is more front-loaded than that of CO₂, so over a 20-year time period it’s 80 times more potent. Figure 2 shows the equivalent CO₂ emissions across the electricity sector in Thailand, broken down by each fuel type (IEA, 2025). Gas power plants are now the largest single source of CO₂ emissions in Thailand’s power sector, responsible for about 46 million tonnes annually, compared with 35 million tonnes from coal (IEA, 2025). Expanding gas therefore risks deepening, rather than reducing, Thailand’s near-term climate impact.

Thailand Power Sector Emissions by Fuel

Most recent year; combustion-only CO₂e (≈ stack CO₂)



*CO₂e here includes only combustion emissions (IEA). Upstream methane leakage not included.

Figure 2 – Equivalent CO₂ emissions from combustion plants, taken and adapted from IEA (2025).

Potential contribution to toxic air

While the debate around gas power has focused largely on its climate and economic impacts, its toxic air pollution footprint has received far less attention. In reality, gas power plants emit a substantial volume of harmful pollutants that damage health and burden the economy.

Air pollution remains one of Thailand's leading public health challenges. According to the State of Global Air (SOGA, 2024), exposure to outdoor air pollution is linked to around 9 % of all deaths nationwide. In Bangkok, the impacts are especially severe. Annual deaths attributable to fine particulate matter ($PM_{2.5}$) have more than doubled, from about 3,600 in 2000 to over 8,000 in 2019 (SOGA, 2024). Recurrent pollution episodes regularly blanket the capital, prompting emergency responses such as temporary school closures and public-health advisories (The Guardian, 2025).

Air quality in Thailand has therefore become not only a public health emergency but also a major economic concern, with pollution-related illnesses reducing workforce productivity and straining healthcare systems. Yet amid this growing crisis, one significant and continuous source of pollution has received comparatively little attention — emissions from gas-fired power plants.

Gas combustion produces lower particulate emissions than coal but still releases significant amounts of nitrogen oxides (NO_x), sulphur dioxide (SO_2), and fine particulate matter ($PM_{2.5}$). These pollutants contribute to smog formation, respiratory and cardiovascular disease, and premature deaths, especially in densely populated regions.

Previous studies have tried to estimate emissions from Thailand's gas fleet, but most rely on global-average emission factors or outdated data that don't reflect the country's newer power plants or Thai-specific operating conditions. For instance, Krittayakasem et al. (2011) used Thai data but only covered plants operating up to 2006. As a result, the true scale of toxic emissions from Thailand's rapidly expanding gas sector has remained underestimated.

Results

In this study, we estimate pollutant emissions from Thailand's gas power plants using the most recent measured data reported in Environmental Impact Reports (EIRs), which are generally conducted twice annually for each halves of the year (January-June and July-December). These measurements were converted into annual totals using Thailand's national average capacity factor for gas-fired generation and adjusted to reflect both operational plants and those planned or under construction. Full details of the emission calculation approach, capacity factor assumptions, and projections for future plants are provided in the Methodology section.

We find that Thailand's gas power sector represents a significant source of toxic emissions. Table 1 shows the annual total pollutant emissions from gas power plants considered in this study. Across the country, gas power plants emit an estimated 33.4 kilotonnes (kt) of nitrogen oxides (NO_x), 1.7 kt of sulphur dioxide (SO_2), and 0.42 kt of fine particulate matter ($\text{PM}_{2.5}$) every year.

Table 1 – Our estimated annual total pollutant emissions from Thailand's gas power plants (operating and planned)

Pollutant	Total (kilotonnes/ year)
Nitrogen oxides (NO_x)	33.4
Sulphur dioxide (SO_2)	1.7
Particulate matter ($\text{PM}_{2.5}$)	0.4

The majority of these emissions (Table 1) originate from plants already operating, however, plants coming on-line in the future will also have a significant contribution to. For instance, the gas plants that are not in operation yet account for 4.0, 0.5, and 0.4 kilotonnes of NO_x , SO_2 , and $\text{PM}_{2.5}$, respectively. Many of these facilities are being constructed without advanced emission-control systems such as Selective Catalytic Reduction (SCR), which can significantly cut NO_x emissions. At the same time, most gas plants are sited near major population and industrial centres including Bangkok, Rayong, and Chonburi, where exposure risks are highest. This pattern reflects regulatory gaps and

the persistent perception of gas as a “clean” fuel, despite its substantial contribution to Thailand’s air pollution and health burden.

Figure 3 shows the distribution of gas-fired power plants, and highlights that they are heavily concentrated around Bangkok and the Eastern Economic Corridor - regions that also have the highest population density and economic activity. This means emissions from gas powered electricity generation are released precisely where exposure risks are greatest.

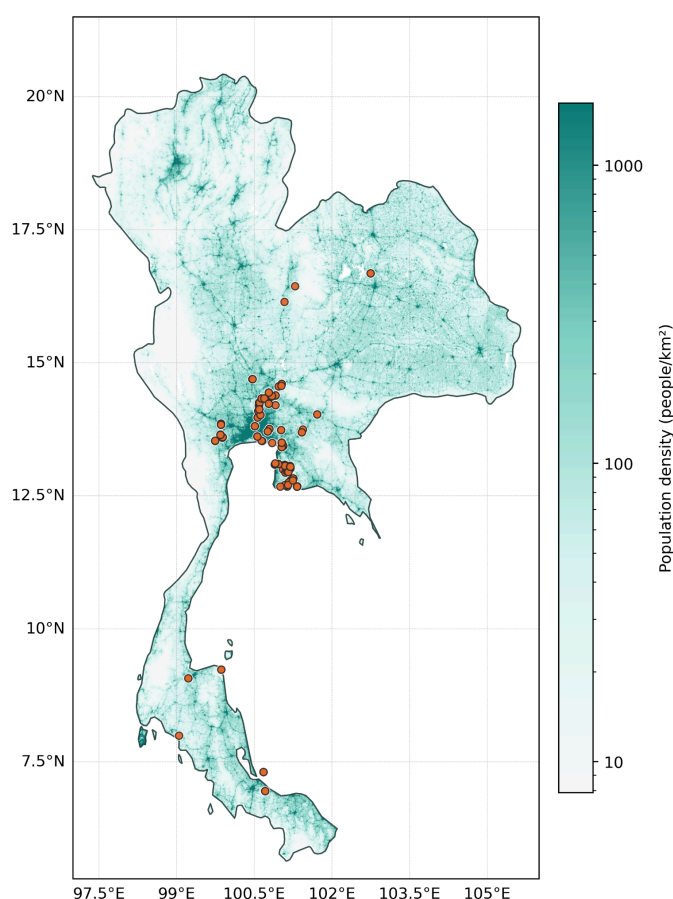


Figure 3 – Map of operational, under construction and proposed gas power plants across Thailand considered in this study and population density taken from World Pop (2018)

With the majority of the gas power plants being located around Bangkok, we put the emissions from this source into perspective by comparing it to other important urban pollution sources in the Bangkok Metropolitan Region (Figure 4). The results reveal a striking finding: gas power plants, though far fewer in number, emit more nitrogen oxides (NO_x) than any of buses, passenger cars, pick-up trucks, motorcycles, and taxis (Figure 4). This comparison underscores how Thailand’s “clean” gas fleet is, in reality, a major contributor to the region’s toxic emissions.

Comparison of NO_x emissions

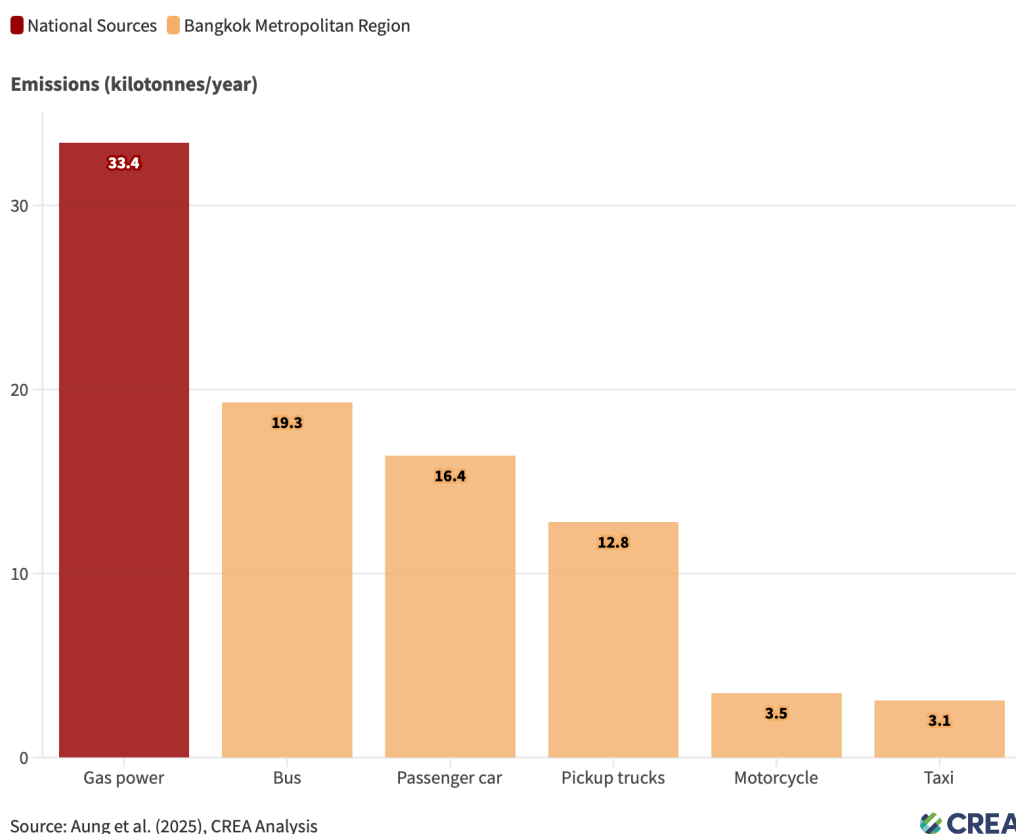


Figure 4 – Comparison of national NO_x emissions from gas power plants estimated in this study, and a comparison to other notable urban sources in Bangkok Metropolitan Region (BMR) taken from Aung et al. (2025)

Health and policy implications

These findings reveal that gas power is not the “clean” option it is often portrayed to be. While natural gas emits less CO₂ than coal per unit of energy (USEIA, 2023), it remains an important source of nitrogen oxides (NO_x), which contribute to Thailand’s chronic air pollution problem (Health Effects Institute, 2025). In addition, gas-fired power plants are typically located near population and industrial hubs: such as Bangkok, Rayong, and Chonburi with health impacts that are concentrated where most people live and work (Pollution Control Department, 2024).

Recent assessments show that over 70 percent of Thailand’s population is exposed to PM_{2.5} levels above national standards (Energy Policy Institute, 2019) and that combustion from the power and industrial sectors is a key contributor (Pollution Control Department, 2024). The national standard for PM_{2.5} is 15 µg/m³, which is three times higher than the guideline value set by the World Health Organization guideline (The Nation, 2022). According to the Health Effects Institute (2025) and IHME (2016), air pollution in Thailand was responsible for more than 54,000 premature deaths in 2023, imposing an economic cost equivalent to around 6 percent of GDP through lost productivity and healthcare spending.

Phasing out gas in favor of clean energy sources that don’t emit air pollutants would therefore bring immediate health and economic co-benefits, including reducing hospital visits, improving workforce productivity, and easing pressure on Thailand’s air-quality management systems. Cutting combustion emissions from the power sector would directly reduce NO_x and secondary PM formation, lowering ambient concentrations and on-the-job exposures for high-risk groups like street vendors, delivery riders, and security staff (Archer et al., 2024; Clean Air Asia, 2023).

Rethinking Thailand's energy pathway

Thailand stands at a critical juncture. Continuing to expand gas power will lock the country into higher energy costs, worsening air pollution, and rising greenhouse gas emissions for decades to come. The evidence presented here shows that gas is not a clean transition fuel, but a growing source of health-damaging and climate-warming pollution concentrated in Thailand's most densely populated regions.

By contrast, the technologies needed to replace gas are already available and increasingly cost-effective. Solar and wind power, supported by battery storage, can now deliver electricity cheaper than gas, while avoiding both toxic emissions and import dependence. This transition also advances Thailand's climate and development objectives: supporting its Nationally Determined Contribution (NDC), aligning with the Bio-Circular-Green Economy (BCG) strategy, and complementing prospective Clean Air Act measures; while also reducing fiscal exposure to imported LNG and freeing resources for renewables, grid upgrades, employer-provided mitigation (e.g., PPE, shift scheduling), and targeted health screenings (World Bank, 2023; Ministry of Energy, 2023; Archer et al., 2024).

Phasing out gas power offers immediate and tangible benefits: cleaner air, reduced healthcare costs, and greater energy independence. As global markets move away from fossil fuels, Thailand has an opportunity to lead the region in a clean energy transition—one that prioritizes the health of its people and the stability of its economy.

Methodology used in this study

This briefing provides the most up-to-date and locally grounded assessment of pollutant emissions from Thailand's gas power sector. For operating plants, we retrieved Environmental Impact Reports (EIRs) for gas power plants recorded by the Pollution Control Department (PCD), covering as many operational plants as possible.

Generally, measurements for EIRs are conducted twice a year, once in the first half of the year (January–June) and once in the second half (July–December). Differences in electricity consumption between these two periods can lead to variations in pollutant emissions. Therefore, to construct a long-term picture of emissions from this source, we average data across both seasons. Most of our data come from 2023, however, for some plants, we also incorporate data from adjacent years (2022 and 2024) to minimize the influence of missing values.

Annual total emissions, E (tons/year), were estimated using the following formula:

$$E = MF \times SIY \times CF$$

where:

- MF is the measured mass flow rate (g/s);
- SIY is the number of seconds in a year; and
- CF is the national average capacity factor for gas power plants (%).

The capacity factor (CF) was derived from Thailand's total gas-fired generation and installed capacity data reported by EMBER (2023), estimated at 41 %. This approach provides a consistent estimate across all plants, though it does not adjust for variations in utilisation between facilities.

For some existing plants, and for all proposed plants, data on emission rates are missing. To estimate these emissions, we first calculate average emissions per unit of electricity for plants in operation, aggregated into five-year intervals between 1991 and 2025. For existing plants with missing data, we assign the emission factor corresponding to the interval in which they began operating. For plants that will come online in the future, we use the emission factor from the most recent period (2021–2025).

Appendices

Appendix A: Unit level results

Table of natural gas plants included in this study, with combustion technology, capacity, and estimated annual NO_x, SO₂ and TSP emissions, all assuming an average utilisation rate of 41 %.

Table A1 – Unit-level data on technology, capacity, and annual emissions of pollutants

Plant and Unit Name	Plant Technology	Capacity (MW)	NOX emission (tons/year)	SO2 emission (tons/year)	TSP emission (tons/year)
Announced					
South Bangkok power station Unit CC5	combined cycle	700	409.0	22.0	17.3
South Bangkok power station Unit CC6	combined cycle	700	409.0	22.0	17.3
South Bangkok power station Unit CC7	combined cycle	700	409.0	22.0	17.3
Construction					
Hin Kong power plant Unit 2	combined cycle	700	409.0	22.0	17.3
U-Tapao Hybrid power station Unit 1	combined cycle	80	46.7	2.5	2.0
Pre-Construction					
Burapa power station Unit 1	combined cycle	540	315.5	17.0	13.4
Nam Phong power station Unit 3	combined cycle	650	379.7	20.4	16.1
North Bangkok power station Unit 3	combined cycle	700	409.0	22.0	17.3
North Bangkok power station Unit 4	combined cycle	700	409.0	22.0	17.3
Surat Thani power station Unit CC1	combined cycle	700	409.0	22.0	17.3
Surat Thani power station Unit CC2	combined cycle	700	409.0	22.0	17.3
Operational					
Amata (Chonburi) power station Unit 1	combined cycle	140	120.7	2.9	4.5
Amata (Chonburi) power station Unit 2	combined cycle	140	104.1	9.4	5.0
Amata (Chonburi) power station Unit 3	combined cycle	133	67.0	10.4	2.1
Amata (Chonburi) power station Unit 4	combined cycle	131	63.9	0.4	2.4
Amata (Chonburi) power station Unit 5	combined cycle	131	62.9	0.8	2.8
Amata (Rayong) power station Unit 1	combined cycle	123	34.3	3.6	1.4

Amata (Rayong) power station Unit 2	combined cycle	124	37.9	3.6	1.0
Amata (Rayong) power station Unit 3	combined cycle	133	38.9	3.5	1.4
Amata (Rayong) power station Unit 4	combined cycle	133	35.4	3.5	1.4
Amata (Rayong) power station Unit 5	combined cycle	133	44.0	5.4	1.5
Bang Bo power station	combined cycle	350	377.0	23.6	11.7
Bangkadi Industrial Park power station Unit 1	combined cycle	115	9.0	3.8	1.7
Bangkadi Industrial Park power station Unit 2	combined cycle	115	24.5	3.9	2.5
Bangpa-in power station Unit 1	combined cycle	117	133.0	1.4	5.2
Bangpa-in power station Unit 2	combined cycle	117	103.9	1.6	5.0
Bang Pakong power station ST3 (BPK-TP3)	steam turbine	576	2087.5	38.6	80.8
Bang Pakong power station ST4 (BPK-TP4)	steam turbine	576	2101.3	25.9	24.6
Bang Pakong power station Unit CC5	combined cycle	710	1267.0	16.4	5.1
Bangpoo cogeneration power station Unit 1-1	combined cycle	120	64.5	2.3	2.3
Bangpoo cogeneration power station Unit 2-1	combined cycle	120	64.5	2.3	2.3
Banpong power station Unit 1	combined cycle	128	27.9	6.8	6.3
Banpong power station Unit 2	combined cycle	128	31.8	7.0	3.8
Berkprai cogeneration power station	combined cycle	99	71.8	1.4	6.4
Chachoengsao NNK cogeneration power station	combined cycle	110	69.1	2.7	1.4
Chaiyo power station	combined cycle	123	28.9	4.4	4.5
Chana power station Unit 1	combined cycle	710	300.8	5.8	18.1
Chana power station Unit 2	combined cycle	766	176.4	6.3	14.2
Chonburi Ng Project power station Unit 1	combined cycle	625	365.1	19.6	15.5
Chonburi Ng Project power station Unit 2	combined cycle	625	365.1	19.6	15.5
Chonburi Ng Project power station Unit 3	combined cycle	625	365.1	19.6	15.5
Chonburi Ng Project power station Unit 4	combined cycle	625	365.1	19.6	15.5
EGCO cogeneration (Rayong) power station	combined cycle	117	199.3	6.6	3.6
Global Power Synergy Central Utility Plant 1	combined cycle	226	138.5	19.0	4.6
Global Power Synergy Central Utility Plant 2	combined cycle	113	91.3	2.1	6.7
Glow IPP power station Unit 1	combined cycle	357	342.0	2.1	2.7
Glow IPP power station Unit 2	combined cycle	357	307.6	2.2	3.2

Glow SPP 11 power station Unit 1-1	combined cycle	162	270.1	1.5	7.7
Glow SPP 11 power station Unit 2-1	combined cycle	110	83.0	2.7	1.6
Glow SPP 1 power station Unit 1	combined cycle	140	110.8	3.2	1.2
Glow SPP 1 power station Unit 2	combined cycle	140	104.7	3.0	1.2
Gulf BL power station	combined cycle	127	539.5	2.4	1.0
Gulf BP power station	combined cycle	127	80.0	0.6	1.0
Gulf CRN power station	combined cycle	126	90.5	1.4	6.2
Gulf KP1 power station	combined cycle	110	70.8	1.5	1.3
Gulf KP 2 power station	combined cycle	110	83.9	1.7	1.4
Gulf NC power station	combined cycle	127	87.9	3.0	7.3
Gulf NK2 power station	combined cycle	133	102.6	0.7	1.4
Gulf NLL power station Unit 1	combined cycle	123	59.6	1.1	1.4
Gulf NLL power station Unit 2	combined cycle	127	49.8	0.5	1.0
Gulf NPM power station CC1	combined cycle	135	72.6	1.8	1.3
Gulf NRV power station Unit 1	combined cycle	128	80.7	1.9	1.3
Gulf NRV power station Unit 2	combined cycle	128	93.8	1.5	1.4
Gulf Tasit 1 power station	combined cycle	138	56.3	1.0	1.0
Gulf Tasit 2 power station	combined cycle	138	71.4	2.0	1.1
Gulf Tasit 3 power station	combined cycle	130	63.6	2.3	1.1
Gulf Tasit 4 power station	combined cycle	130	60.3	1.7	1.0
Gulf TLC power station	combined cycle	114	70.7	0.9	1.4
Gulf VTP power station	combined cycle	137	38.9	0.9	0.5
Gulf VTP power station	combined cycle	137	31.3	0.6	0.5
Hemaraj Industrial Estate power station	combined cycle	130	31.3	3.0	1.2
Hin Kong power plant Unit 1	combined cycle	700	527.8	4.7	24.4
Kaeng Khoi 2 power station Unit 1	combined cycle	734	693.7	2.9	8.8
Kaeng Khoi 2 power station Unit 2	combined cycle	734	423.5	7.2	5.3
Khanom power station CC4	combined cycle	970	642.5	42.8	7.6
Klong Luang power station	combined cycle	122	13.1	3.2	4.7
Koh Khanun power station Unit 1	unknown	114	61.3	2.2	2.2
Krabi power station	steam turbine	315	394.6	122.9	32.3
Laem Chabang power station Unit 1	combined cycle	140	94.9	10.6	1.4

Laem Chabang power station Unit 2	combined cycle	56	5.4	4.7	3.3
Lat Krabang power station	combined cycle	120	55.6	0.8	2.8
Map Ta Phut BKK power station Unit 1	combined cycle	112	41.2	0.5	4.6
Nam Phong power station Unit 1	combined cycle	355	1290.8	19.9	32.5
Nam Phong power station Unit 2	combined cycle	355	1290.8	19.9	32.5
Nava Nakorn power station Unit 1	combined cycle	139	87.1	1.6	6.8
Nong Khae power station Unit 1	combined cycle	113	197.1	2.4	3.6
Nong Saeng power station Unit 1	combined cycle	800	559.3	11.2	25.5
Nong Saeng power station Unit 2	combined cycle	800	666.6	9.4	8.4
North Bangkok power station Unit 1	combined cycle	670	623.7	9.7	8.4
North Bangkok power station Unit 2	combined cycle	828	102.2	4.5	11.0
Ratchaburi (B.Grimm) power station Unit 1	combined cycle	140	28.9	4.4	4.5
Ratchaburi (B.Grimm) power station Unit 2	combined cycle	140	87.8	7.3	2.2
Ratchaburi Power (RPCL) power station Unit 1	combined cycle	700	508.1	58.8	41.2
Ratchaburi Power (RPCL) power station Unit 2	combined cycle	700	508.1	58.8	41.2
Ratchaburi (RATCHGEN) power station Unit 1	combined cycle	725	365.5	4.0	24.9
Ratchaburi (RATCHGEN) power station Unit 2	combined cycle	725	415.3	3.9	21.0
Ratchaburi (RATCHGEN) power station Unit 3	combined cycle	725	173.4	2.0	12.3
Ratchaburi (RATCHGEN) power station Unit 4	gas turbine	735	143.9	1.7	14.7
Ratchaburi (RATCHGEN) power station Unit 5	gas turbine	735	377.2	510.8	291.3
Ratchaburi World cogeneration power station	combined cycle	234	98.5	2.3	8.3
Rayong Gulf PD power station Unit 1	combined cycle	625	497.8	7.4	16.3
Rayong Gulf PD power station Unit 2	combined cycle	625	283.4	14.5	24.1
Rayong Gulf PD power station Unit 3	combined cycle	625	359.2	11.8	10.1
Rayong Gulf PD power station Unit 4	combined cycle	625	365.1	19.6	15.5
Rayong Sipco power station	combined cycle	160	54.5	4.7	2.2
Rojana power station	combined cycle	275	406.0	0.2	4.4
Saha Patana power station	combined cycle	203	294.1	3.4	6.7
South Bangkok International Airport (SBIA) power station	combined cycle	55	41.0	5.8	6.8

South Bangkok power station Unit CC3	combined cycle	710	1037.7	10.4	6.5
South Bangkok power station Unit CC4	combined cycle	1220	586.1	7.8	11.0
Sriracha power station	combined cycle	700	779.7	35.9	19.8
Sriracha Thai Oil Company power station Unit 1	combined cycle	120	10.1	2.3	2.3
Sriracha Thai Oil Company power station Unit 2	combined cycle	120	6.9	2.3	2.3
Thai Oil Company Sriracha Refinery power station Unit 1	combined cycle	118	134.8	2.5	3.7
U-Thai power station Unit 1	combined cycle	800	584.2	9.5	10.2
U-Thai power station Unit 2	combined cycle	800	446.6	8.4	6.4
Wang Noi power station Unit 4	combined cycle	750	540.2	53.8	55.0

References

Archer, D., Bhatpuria, D., Nikam, J. and Taneepanichskul, N. (2024). 'Particulate matter pollution in central Bangkok: assessing outdoor workers' perceptions and exposure', *Cities & Health*, pp. 1–19. <https://doi.org/10.1080/23748834.2024.2390274>

Agora (2025). Thailand's natural gas crossroads. <https://www.agora-energiewende.org/publications/thailands-natural-gas-crossroads#downloads>

Aung et al. (2025). Environmental impacts and costs of ozone formation in Bangkok Metropolitan Region. <https://www.sciencedirect.com/science/article/pii/S1309104225000522>

Bangkok Post (2025). *LNG prices to keep power bills stable*. Available at: <https://www.bangkokpost.com/business/general/2896833/lng-prices-to-keep-power-bills-stable>

Clean Air Asia (2023). Air Pollution and Health Burden in ASEAN: Country Profile – Thailand. Available at: <https://cleanairasia.org>

Bloomberg NEF (2025). Thailand: Turning Point for a Net-Zero Power Grid. https://assets.bbhub.io/professional/sites/24/19-05-2025_Thailand_Turning-Point-for-a-Net-Zero-Power-Grid.pdf

EMBER (2025a). Thailand. <https://ember-energy.org/countries-and-regions/thailand/#data>

EMBER (2025b). Thailand's cost-optimal pathway to a sustainable economy. <https://ember-energy.org/app/uploads/2025/09/Report-Thailands-cost-optimal-pathway-to-a-sustainable-economy-PDF.pdf>

Energy Policy Institute at the University of Chicago (EPIC) (2019). *Thailand analysis: Air pollution cuts lives short by more than four years in the most polluted areas*. Chicago: University of Chicago. Available at:

<https://epic.uchicago.edu/news/thailand-analysis-air-pollution-cuts-lives-short-by-more-than-four-years-in-the-most-polluted-areas/>

Guardian, The (2025). Pollution-hit Bangkok closes hundreds of schools and offers free public transport

<https://www.theguardian.com/world/2025/jan/24/bangkok-pollution-hundreds-schools-closed-free-public-transport>

Health Effects Institute (2025). State of Global Air 2025. Available:

<https://www.stateofglobalair.org/>

IEA (2025). <https://www.iea.org/countries/thailand/electricity>

Institute for Health Metrics and Evaluation (IHME) (2016). The Cost of Air Pollution: Strengthening the Economic Case for Action. Washington, DC: World Bank Group.

<https://documents1.worldbank.org/curated/en/781521473177013155/pdf/108141-REVISED-Cost-of-PollutionWebCORRECTEDfile.pdf>

Investing.com (2025). LNG Japan/Korea Marker PLATTS Future (JKMc1).

<https://www.investing.com/commodities/lng-japan-korea-marker-platts-futures>

Krittayakasem et al. (2011). Emission Inventory of Electricity Generation in Thailand.

https://www.thaiscience.info/Journals/Article/JOSE/10889664.pdf?utm_source=chatgpt.com

Ministry of Energy (2023) *Thailand's Energy Statistics 2023*. Bangkok: Office of Energy Policy and Planning.

Nation Thailand (2025). EGAT unveils natural gas - LNG - RE integration for Net Zero at Gastech 2025.

<https://www.nationthailand.com/pr-news/pr-news/40055739>

Nation, The (2022). Thailand adopts PM2.5 safety standard on par with developed nations.

<https://www.nationthailand.com/in-focus/40017734>

Pollution Control Department (2024). *Thailand Air Quality Data Portal*. Ministry of Natural Resources and Environment. Available at: <https://www.pcd.go.th>

SFOC (2021). Bridge to Death: Air Quality And Health Impacts of Fossil Gas Power.
https://energyandcleanair.org/wp/wp-content/uploads/2021/12/SFOC-Air-Quality_Health-Impacts_Gas-Power_.pdf

S&P Global Commodity Insights (2024). *State policies, domestic gas output may curb Thailand's LNG import growth in 2024*. Available at:
<https://www.spglobal.com/commodity-insights/en/news-research/latest-news/coal/011224-state-policies-domestic-gas-output-may-curb-thailands-lng-import-growth-in-2024>

SOGA (2024). Thailand Air Pollution and Health Country Profile
<https://www.stateofglobalair.org/resources/countryprofiles>.

Thai Publica (2025). รัฐบาลปรับเป้า Net zero เร็วขึ้น 15 ปี – จุดเปลี่ยนครั้งใหญ่ เขียวอนาคตอุตสาหกรรมไทย. <https://thaipublica.org/2025/10/scb-eic-net-zero/>

U.S. Energy Information Administration (EIA) (2023) *How much carbon dioxide is produced when different fuels are burned?* Available at:
<https://www.eia.gov/tools/faqs/faq.php?id=73&t=11>

World Bank (2023) *Thailand Country Climate and Development Report*. Washington, DC: World Bank Group. Available at:
<https://www.worldbank.org/en/country/thailand/publication/th-ccdr>

World Pop (2018). The spatial distribution of population density in Thailand in 2020.
<https://hub.worldpop.org/geodata/summary?id=44120>