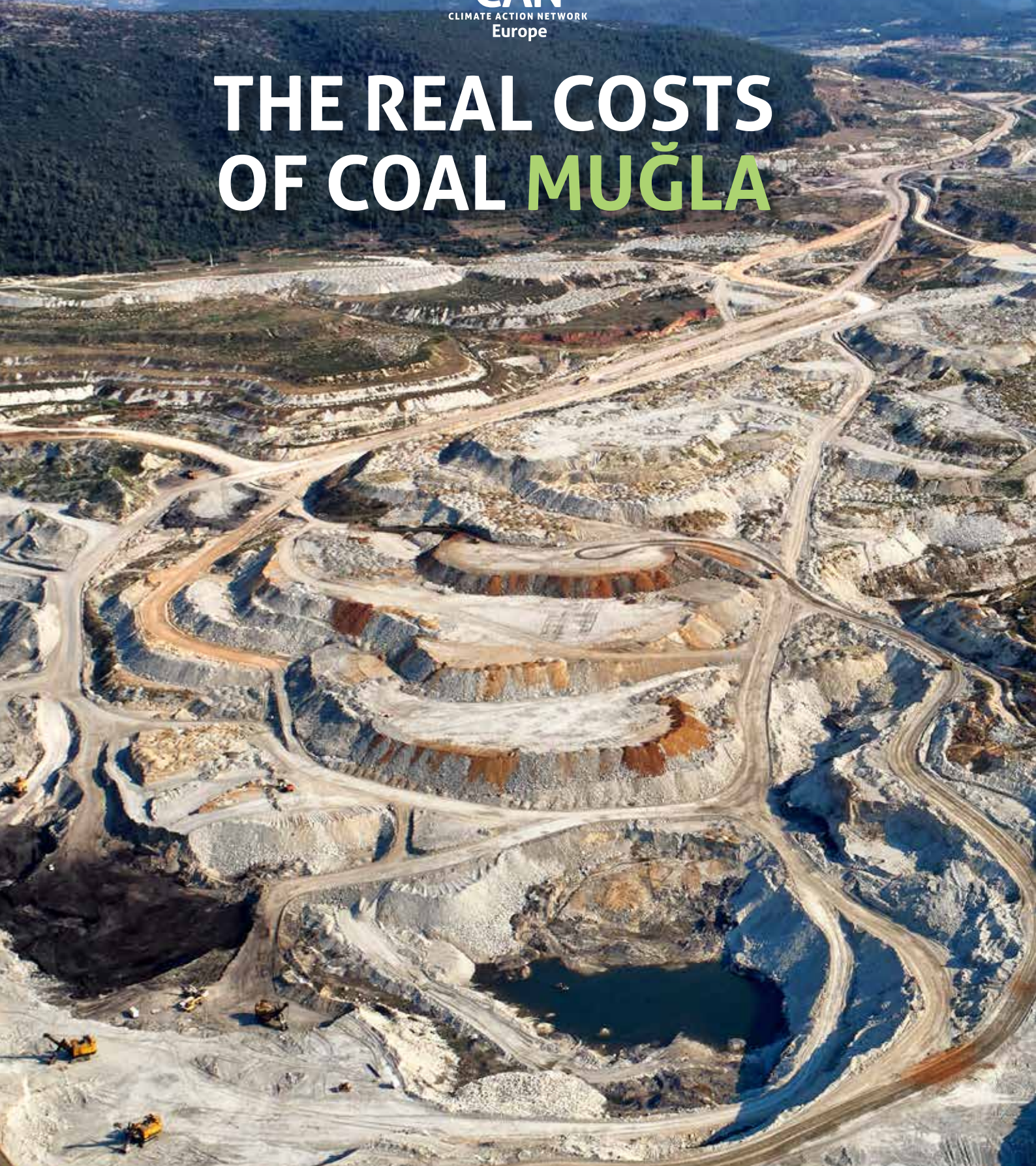


THE REAL COSTS OF COAL MUĞLA



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For full methodologies, project background, and resources, see the original report in Turkish at <http://costsofcoal.caneurope.org/>

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CONTENTS

Foreword.....	4
Executive Summary.....	8
About This Research.....	14
The History of Coal in Muğla.....	15
Conclusion and Recommendations.....	20





WE CANNOT AFFORD ANY MORE COAL! THE TOLL

The story of coal exploitation in Turkey's Muğla region told by this study has many of the regrettable hallmarks so characteristic of obsolete energy systems based on last century's fossil fuel technologies. It's a recognizable story of environmental degradation assumed by many to be unavoidable in the face of growing needs for affordable energy.

The enormous costs of coal exploitation to livelihoods, air, land and water, and to our climate, are often not readily visible or are considered in a compartmentalized fashion, which – intentionally or not – often serves only to blur our vision and decision-making.

This study is different. It pulls together the many pieces of the enormous puzzle often referred to as externalities of coal exploitation, yet another term blurring our appreciation of the entire toll we all pay for continued reliance on coal – in Muğla and elsewhere. This study does more than bring home the big picture made up of real and visible costs of coal to our environment. It illuminates the closely intertwined lives of people, communities and social capitals inexorably linked to that environment.

By so doing, this study goes a long way towards preventing decision makers from turning a blind eye to just how many and how much is being threatened by the prospect of extending the lifespans of Muğla's coal mines.

The time

That we cannot afford the real costs of coal is truer today than it was yesterday. It will be an even more pressing fact tomorrow. Time to face up to this is running out. The landmark IPCC Special Report on Warming of 1.5 °C demonstrating that the impacts of climate change will only get worse if we don't limit the temperature rise to 1.5 °C, made the necessity of ending coal crystal clear. This study, you are holding in hands, shows that continued coal exploitation in Turkey's Muğla region will not only accelerate climate change but may spell the end of livelihoods for thousands in Turkey and across borders.

The study shows how pollution from Muğla's coal is carried by air and by sea far and wide bringing the real costs of coal to people and communities as far as Greece, Cyprus, Egypt and the Near East. A coal plant in any one country is a problem for us all.

The clock is ticking. The more we snooze, the more we all lose.

The transition

Finally, the study offers valuable lessons to all that decide to wake-up and commit to accelerating our energy transition away from fossil fuels and toward energy-efficient, renewable and – hence – sustainable systems of the future. The transition is not going to work unless its costs and benefits are distributed fairly. Either it will be just, or there will not be a successful transition. In practice, this means that local communities – whether affected by current exploitation of coal or involved in the emerging new patterns of production, distribution and use of energy – cannot be considered as just another, optional voice in this change otherwise to be governed by policy makers in capital cities. Local communities should be at the steering wheel, driving the required change. Last but not least, this report sends its solidarity messages to the villagers, especially to the women of the region who have been fighting to protect their lives and livelihoods for so long that they became inspiration for many of us.

CAN EUROPE Board Chair, Céline Charveriat

THE 'BLACK COAL' DISEASE, DIAGNOSIS AND TREATMENT REPORT

Linguistics experts have identified three distinct definitions for the word "report": The first states that a report is a written account of the findings, comments and observations of an investigation or research. The second defines it as a form of narration and expression, while the third refers to a medical report, a written document that describes a patient's current state and diagnosis.

The Real Costs of Coal – Muğla report published by CAN Europe reflects all three of these definitions. First, it calculates the "often overlooked, but real 'external costs' of coal-fired power plants and coal production facilities". Second, it focuses deeply on a single region, analyzing the impacts, dangers and alternatives of coal using the striking metaphor of an "open-air laboratory". Third, it is a full medical report presenting the finding of the tests carried out in this "laboratory", including:

- The rapid collapse of the planet's climate;
- The rapid degradation of the region's air, water, sea, soil, forests and living things; and
- The severe disease contracted by the region's human population, whose culture, history, economy and basic rights in other words, whose entire civilization — is under heavy assault.

The report also includes recommendations on treatment methods for this condition.

The Real Costs of Coal – Muğla report follows other recently published reports showing that:

- "Evidence of human-caused climate crisis has now reached gold-standard-level certainty."
- Ice melting and ocean warming in Antarctica are accelerating faster than previously predicted.
- The past four years were the four warmest years ever recorded.
- At least one-third of the Himalayan glaciers will melt by the end of the century, leaving no fewer than 1.5 billion people without food and water and in a state of conflict.
- Stratocumulus clouds will vanish within a century, leading to an additional hellish global temperature rise of 8 °C.

- Coal and other fossil fuels constitute the biggest threat to human health, with 90 percent of all children globally exposed to dangerous levels of air pollution.
- The plastic-waste invasion has reached the world's deepest ocean trench.
- Arable land productivity has decreased by 20 percent over the course of the past two decades, greatly endangering food security.
- The world's plants, insects and microbes are rapidly disappearing, and we are heading toward an "insect apocalypse".
- Turkey's dependence on coal-fired power plants increased its greenhouse-gas emissions by 49 percent from 2005 to 2016 and caused the air quality in large cities and industrialized regions to drop well below World Health Organization standards.

The Real Costs of Coal - Muğla report is thus the latest -for the time being- in a series of reports that pre-diagnose a disease worse than the bubonic plague, the "black death" of the medieval ages, while also showing that this disease can be tackled, so long as we take rapid action. In January 2019, Turkey's Minister of Treasury and Finance tweeted: "We achieved our '100 million tons of coal production' target, which was the most important part of our domestic coal push directed at reducing our current account deficit. I congratulate everyone involved for their contributions." He also shared the following tweet from the country's Minister of Energy and Natural Resources: "We broke the Turkish Republic record with 101.5 million tons of domestic coal production. With our people's energy and our country's strength, we provided an important contribution to reducing our current account deficit on the path to 'Independent Energy, Strong Turkey'."

The Real Costs of Coal - Muğla report, on the other hand, diagnoses a severe disease through the following statement: "Coal has become one of the most important factors shaping the historical geography of Muğla for the past 35 years, as the province hosts three coal-fired power plants and several lignite mines that provide fuel to these power plants. This geographic change has brought with it heavy ecological, social and economic costs." Do you think that "reducing the current account deficit" will be sufficient to cure this disease?

Ömer Madra

AIR: THE BREATH OF OUR PLANET

...

Air is where the seasons are writ
The seasons' cycle is what limits
Human desire.

Should Nature's balance ever be upset,
Oh should the climates change, should seasons flounder,
Oh then that fool called man will forever
Be hunted !

If the climate cycle falters
Mankind will fall prey to his greed and arrogance
He will exhaust the fish and the dolphin in the seas
The deer and the fawn in the forest
The tree, the olive, the beech in the earth
The melon in the field the grape on the vine
The bird in the tree, the goat in the mountain.
He will forget he is a part of Nature
He will consume, deplete, destroy nature
He will suppose himself master of the world
That is why the world's balance is held by Air.
Air.

For should the order of the climate change
Should the seas rise
Oh there is no longer a Noah to build an ark
So remember

The law of the air is written in the skies
Raise your head to the sky
Look up there
Read !

Air
Our life
Our breath
Our sacred, our holy Air !

...

Buket Uzuner

**This quote is an excerpt from the novel called "AIR" (Hava) by Turkish ecofeminist writer Buket Uzuner. "AIR" is the third novel of her "Nature Quartet", which include "Water", "Earth" and "Fire". The piece is translated by Pelin Arıner from Turkish.*

EXECUTIVE SUMMARY

For the past 35 years, coal has been reshaping the province of Muğla in western Turkey, which is home to three coal-fired power plants and several lignite mines that provide fuel to these facilities. This geographical transformation has brought with it heavy ecological, social and economic burdens.

Although these three coal-fired power plants are all nearing their retirement age, plans to rehabilitate them and increase their capacity were designed after the facilities were privatized in 2014, with an aim toward extending their lifespan for an additional 25 years. This extension would lead to the permanent destruction of the province's natural environments and habitats through the expansion of existing coal mines and ash dams, adding to the environmental stress already caused by coal-fired power plants.

As part of the extensive research launched by CAN Europe in 2018, *The Real Costs of Coal – Muğla* report uses the Muğla province as a case study to reveal the actual costs of coal-fired power plants as they are borne by the environment and by society. The report also demonstrates how available alternatives can put an end to these costs, which are generally defined as "externalities," and thus disregarded when calculating the price of investments in coal-based energy production and related policies.

If all areas licensed for coal production were to become operational over the next 30 years, it could lead to the destruction of an additional 11,200 hectares of forested area in Milas and 7,250 hectares in Yatağan, a total area equivalent to 30,000 football fields.



This report is the result of technical modeling based on original data, information requests, ethnographic data collection, literature review and contributions from various scientists. It summarizes the impacts of coal and coal-fired power plants in Muğla.

The environmental costs of coal

Assessing the environmental impacts of coal in Muğla province requires a holistic approach that takes into consideration both coal mines and coal-fired power plants. Coal mines in Yatağan and Muğla are spread over a wide geographical area, causing extensive land degradation, ecosystem damage, water pollution and air pollution. Pollution from the Yatağan, Yeniköy and Kemerköy coal-fired power plants harms plants, forests, wetlands, bees and other animals. The unsafe disposal of wastewater from coal-fired power plants and of coal ash further pollutes and damages the environment.

According to the contributing report *The Impacts of Muğla's Three Coal-Fired Power Plants and Open-Pit Lignite Mining Facilities on Forest Ecosystems*:

- After 13 mine operating licenses were granted to the private sector in 2014, the total land area allocated to lignite mines reached 21,000 hectares in Yatağan and 23,000 hectares in Milas. Of these totals, 47.3 percent are forested areas.
- The total area covered by open-pit lignite mining operations in the region since 1979 is 5,000 hectares (equivalent to 7,800 football fields). Data about the extent of forest and agricultural areas destroyed as a result is unavailable.
- If all areas licensed for coal production were to become operational over the next 30 years, it could lead to the destruction of an additional 11,200 hectares of forested area in Milas and 7,250 hectares in Yatağan, a total area equivalent to 30,000 football fields.
- Forest ecosystems of the region are also impacted by the environmental pollution created by coal-fired power plants. For example, the ash dams where hazardous solid and liquid waste from all three of Muğla's coal-fired power plants is collected cover a total forested area of 300 hectares (equivalent to 470 football fields).

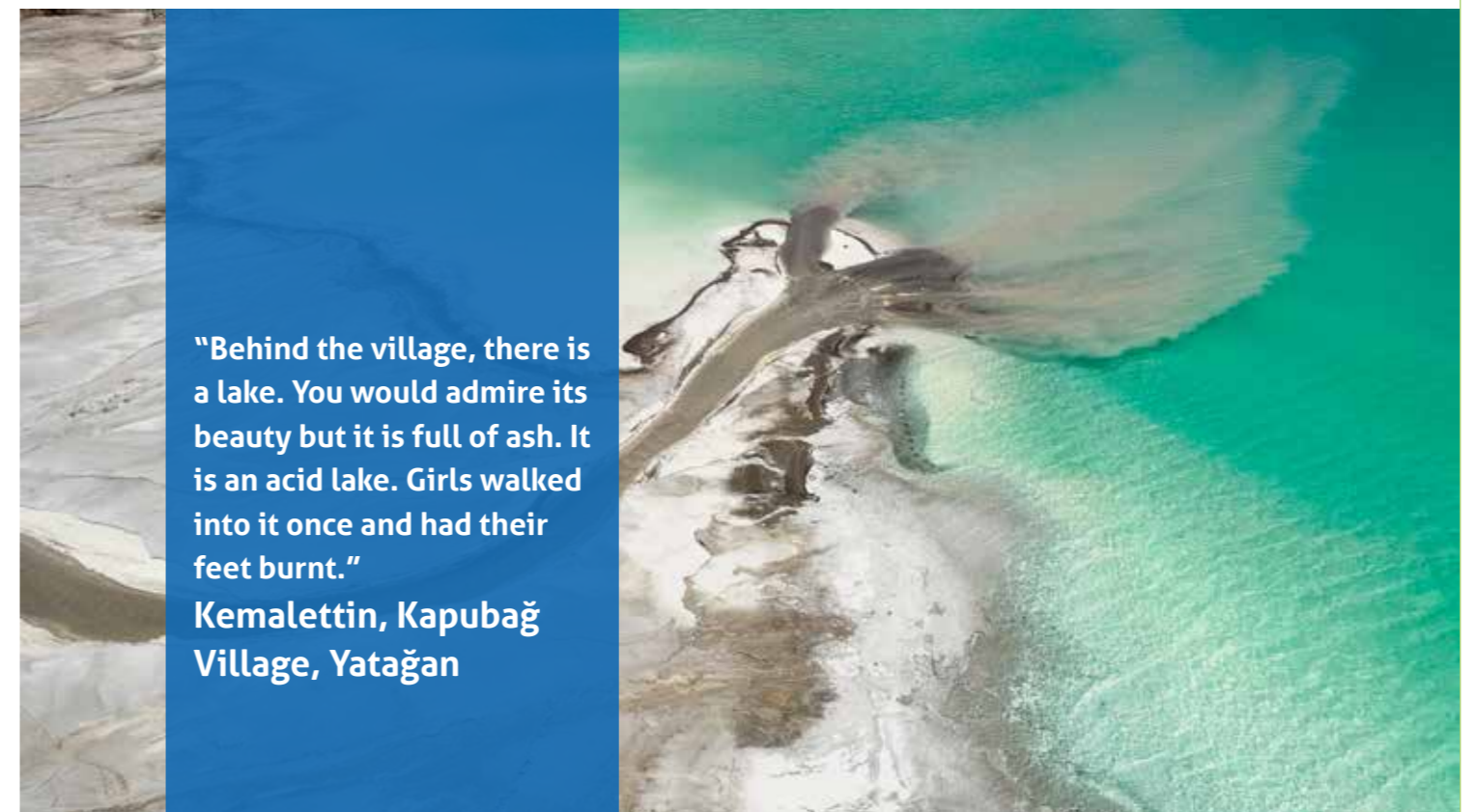


"In modeled 1.5 °C pathways... of global electricity in 2050, the use of coal shows a steep reduction in all pathways and would be reduced to close 0% of electricity."
**IPCC Special Report:
Global Warming of 1.5 °C**

According to the results of *The Real Costs of Coal's* air-pollution dispersion modeling:

- Annual mercury emissions from the Yatağan, Yeniköy and Kemerköy coal-fired power plants exceed 1 million tons. Twenty percent of these emissions are deposited in the waters of the Mediterranean, where they accumulate in fish tissue and enter the food chain. If these plants remain operational, they will emit 435,000 tons of sulfur dioxide, 355,000 tons of nitrogen oxide, 29,000 tons of dust and 22,000 kilograms of mercury between 2018

- and 2043 (even if the required investments are made in them in accordance with environmental regulations).
- Air pollution caused by Muğla's coal-fired power plants reaches the highest concentration levels in Yatağan, Milas, Kavaklıdere and Ula. However, due to prevailing winds and other atmospheric factors, primary particulate matter (PM2.5) emissions travel across the Mediterranean Sea to the Greek island of Rhodes and to Egypt in the south, reach the province of Aydın in the north, and extend to Greece in the west, and to Palestine and Israel in the east.



"Behind the village, there is a lake. You would admire its beauty but it is full of ash. It is an acid lake. Girls walked into it once and had their feet burnt."
Kemalettin, Kapubağ Village, Yatağan

The three coal-fired power plants in Muğla, for example, emitted **360 million tons of CO₂** between 1982 and 2017 and will continue to contribute to global warming even after the planned upgrade investments are made.

The three coal-fired power plants are expected to emit an additional **328 million tons of CO₂** in total if they continue to operate until 2043.



Currently, air pollution from coal-fired power plants in the region causes **280** premature deaths per year.

The air pollution caused by the province's three coal-fired power plants is estimated to have been responsible for **45,000** premature deaths from 1982, when the first plant unit began operating in Yatağan, until the end of 2017.

The health costs of coal

According to the health-impact modeling carried out as part of The Real Costs of Coal report, coal imposes a very heavy burden on human health in Muğla.

- Currently, air pollution from coal-fired power plants in the region causes 280 premature deaths per year. A total of 61,000 work days per year is lost due to diseases and premature death.
- The air pollution caused by the province's three coal-fired power plants is estimated to have been responsible for 45,000 premature deaths from 1982, when the first plant unit began operating in Yatağan, until the end of 2017.
- If these coal-fired power plants remain operational for 50 years, they are expected to cause 5,300 additional premature deaths even if the required investments are made in them in accordance with environmental regulations.

Coal's contribution to climate change

In a report published in October 2018, the Intergovernmental Panel on Climate Change (IPCC) laid out the reasons it is essential to limit global warming to 1.5 °C above pre-industrial levels, a target that is still achievable. According to the report, one of the most crucial steps necessary to meet that target is to urgently phase out coal investments, and to realize net-zero carbon consumption by 2035 for OECD countries, including Turkey, and by 2050 for non-OECD countries.

However, there is still no economically feasible technology that can capture carbon dioxide, a greenhouse gas that contributes significantly to global warming, before it is released to the atmosphere. The three coal-fired power plants in Muğla, for example, emitted 360 million tons of CO₂ between 1982 and 2017 and will continue to contrib-

ute to global warming even after the planned upgrade investments are made. The Yatağan, Yeniköy and Kemerköy coal-fired power plants are expected to emit an additional 328 million tons of CO₂ in total if they continue to operate until 2043.

According to calculations made by Professor Doğanay Tolunay for *The Real Costs of Coal – Muğla* report, if the forest ecosystems located within the boundaries of the Yatağan and Milas coal-mining lease areas are entirely destroyed for coal extraction, the loss of biomass, soil, aboveground dead organic matter and dead wood will create a carbon-sink-area loss equivalent to 9 million tons of carbon dioxide. Losing this carbon-sink potential would result in 66,200 additional tons of CO₂ emissions per year, or a total of 2 million tons of additional CO₂ emissions over 30 years of mining activity.

The social and cultural costs of coal in Muğla

Coal-fired power plants and coal production facilities in Muğla also cause significant harm to the region's socio-economic structure.

Over the past 35 years, eight villages have been forced to relocate -some more than once- when coal mines became operational. If the capacity of these plants is increased and their lifespans extended as planned, more areas licensed for coal mining will become operational, leading to 40 additional villages being forced to entirely relocate or for their residents to leave their homes due to the expropriation of olive groves and agricultural forest areas that they rely on for income. This would entail the direct or indirect displacement of approximately 30,000 people: 8,300 people in Milas and 20,400 people in Yatağan and Menteşe. Farmers in the area around the Yatağan coal-fired power

“Acid rains ruined our gardens. Cucumbers are all yellow now. Sometimes the smell is so unbearable that we dare not be out in the rain.”
Şefik, The Representative of Karacahisar Village, Milas



plant have filed lawsuits charging that pollution from the power plant has caused significant decrease in agricultural yields and therefore financial losses. Courts have ruled that this pollution has indeed impaired agriculture in the area, damaged plants that had not yet completed their leaf development stage and decreased yields.

Muğla’s archaeological heritage is also threatened by the coal-fired power plants and coal mine expansions in the region. The triangle today formed by Yatağan, Yeniköy and Kemerköy was referred to in antiquity as Caria, and contains many registered archaeological sites within the boundaries of the areas where lignite extraction permits were awarded, according to an analysis carried out by the Archaeology Society for The Real Costs of Coal report. The

archaeological sites most affected by the coal extraction fields are the ones located between the ancient city of Stratonikeia, a candidate site for UNESCO World Heritage designation, and Lagina. A total of 880 archaeological sites, including first- and third-degree sites where excavations are ongoing, lie within the impact zone of the Yatağan, Yeniköy and Kemerköy coal-fired power plants.

Muğla coal’s burden on the economy

The Yatağan, Yeniköy and Kemerköy coal-fired power plants in Muğla had already reached retirement age when their lifespans were extended through privatization. The burden of the significant state subsidies and incentives provided to these three old and dirty coal-fired power plants is directly reflected in the tax-paying consumers’



The allowances that were paid to these three coal-fired power plants under the Regulation on the Electricity Market Capacity Mechanism, which entered into force in January 2018, to enable them to maintain a certain operational capacity, cost the state budget approximately **187 million Turkish Lira** for the period between January and December 2018.

electricity bills. In other words, the cost of continuing to operate these power plants, which should have been shut down a long time ago, is borne by the citizens, both financially and in terms of the harm they continue to cause to human health and ecosystems.

Where actual data was available, the following subsidies for the Yatağan, Yeniköy and Kemerköy coal-fired power plants were analyzed for The Real Costs of Coal report:

- Each of the three coal-fired power plants benefit from VAT exemption, Customs Duty Exemption, Tax Reduction, Social Security Premium Support (Employer’s Share), Land Allocation and Interest Support through the “prioritized investments” scheme on the grounds

- that they produce electricity from domestic resources.
- In 2017, 30 percent of the total electricity purchased from the Yatağan, Yeniköy and Kemerköy coal-fired power plant operators was done under a guaranteed fixed-price incentive given to power companies that produce electricity from domestic resources. This amounted to a total of 1.10 billion Turkish Lira.
- The allowances that were paid to these three coal-fired power plants under the Regulation on the Electricity Market Capacity Mechanism, which entered into force in January 2018, to enable them to maintain a certain operational capacity, cost the state budget approximately 187 million Turkish Lira for the period between January and December 2018.



“Thanks to olives, I raised my kids, schooled them, saw them married. I will never sell my olive groves to the coal company. I don’t want their money!”
Tayyibe, Turgut, Yatağan

ABOUT THIS RESEARCH

Coal has negative impacts on the natural environment during every stage of its use: from its extraction and transportation, to its preparation (through crushing, sieving and washing) and burning, all the way through to the disposal of the waste produced in each of these stages. It destroys forests, valleys and mountains, while contaminating or depleting ground- and surface-water resources.



“If the remaining lignite mining areas in Muğla region of Turkey become operational as planned: we stand to lose 18,450 hectares of forest”
Association for the Research of Rural Environment and Forestry Issues

It emits a wide range of contaminants and hazardous materials that pollute the soil and air, harming or depleting non-living (or “abiotic”) elements of the ecosystem that are essential to all life, and exhausting the world’s supply of fossil fuels. The disruptions it causes to the life-giving water, carbon and nitrogen cycles are difficult to reverse. The habitat destruction and pollution it creates harms and can even drive into extinction plants, animals and essential microorganisms.

When the ecosystems in which humans live and on which they depend become unhealthy, this also impairs -and even imperils -people’s health and their social, cultural and economic wellbeing. For the past 35 years, coal has been reshaping the province of Muğla in western Turkey, which is home to three coal-fired power plants and several lignite mines that provide fuel to these facilities. This geographical transformation has brought with it heavy ecological, social and economic burdens. Using the Muğla province as a case study, *The Real Costs of Coal – Muğla* report reveals the actual price borne by the environment and by society of generating power with coal. The report also demonstrates how available alternatives can put an end to these costs, which are generally defined as “externalities” and thus disregarded when calculating the price of investments in coal-based energy production and related policies.

Detailed research went into *The Real Costs of Coal – Muğla*. The report’s authors reviewed academic studies and official documents available to the public; filed requests for additional data that should be open to public access under freedom of information frameworks; consulted the testimonies of local Muğla residents and various experts; and examined fieldwork conducted by volunteer experts and nongovernmental organizations. The available technological and emissions data on the three coal-fired power plants in Muğla was used to model the health impact of these facilities and the dispersion of the air pollution they create.

THE HISTORY OF COAL IN MUĞLA

Coal investments in the province of Muğla began at the end of the 1970s when increasing demand for electricity in Turkey coincided with an economic crisis in the country. These investments were in line with energy policies based on utilizing domestic coal resources as a solution to both problems.

In 1979, the Turkish state began operating the Yatağan and Milas lignite mines in Muğla that would provide coal to the province’s new power plants. The first unit of the Yatağan coal-fired power plant, designed by a European consortium under an intergovernmental barter agreement and built with local construction partners, became operational in 1982. The Yatağan facility was followed by the Yeniköy (1986) and Kemerköy (1994) coal-fired power plants, which were built through the same model and put into operation gradually. After being state-operated for nearly 30 years, Muğla’s coal-fired power plants and lignite mines were privatized at the end of 2014 as part of Turkey’s post-2012 energy-liberalization policies.

Today, five years after their privatization, these power plants are in a new phase in which their lifespan is planned to be extended for an additional 30 years past its technical completion. These extension plans apply to a total of 12 coal-fired power plants, state investments planned as of 1950s, built in Muğla and other provinces. Some have already been privatized while the privatization of others is still in process. Lifespan extensions for coal-fired power plants require high-cost investments in upgrading these facilities. Even though such investments do reduce the amount of environmental pollution created by these plants, they cannot eliminate their negative impacts on ecosystems and human health. On the contrary, extending the lifespan of Muğla’s coal-fired power plants implies expanding the lifetimes of the province’s existing coal mines by putting into operation all or most of its licensed private-sector lignite fields, and producing energy from the coal extracted from these mines, regardless of all the cost to be bared.

These plans have brought Muğla and the other provinces hosting these coal-fired power plants -and indeed, the entire country- to an important crossroads. Turkey can decide to calculate the real costs of coal -rather than continuing to treat it as an “inexpensive” energy source- and opt instead to design an energy future that is more socially and eco-

nomically equitable, and more environmentally friendly. Or it can decide to continue down the path of increasing the burden created by coal on nature and society, condemning future generations to bear the direct environmental problems caused by coal as well as the irreversible consequences of climate change.

Muğla holds a historically important place in the development of environmental awareness and campaigning in Turkey. Residents of the province have been mobilizing against the negative health and environmental impacts of coal mining and coal-fired power plants since the 1980s, taking both legal action and non-violent direct action. The Yatağan and Gökova campaigns, which began locally and reached national and even international scale through the efforts of local campaigners, are cornerstones of the Turkish environmental movement. In the late 1980s, local communities, labor unions, prominent legal experts, NGOs and environmental activists came together to warn decision-makers about the many hazards -most notably air pollution- of the coal-fired power plants in Yatağan, Yeniköy and Kemerköy.

Activists initiated a variety of legal proceedings, and brought their case before the European Court of Human Rights (ECHR) when all appeals before Turkey’s domestic courts were exhausted. Recognizing the applicants’ right to bring legal action over the serious health impacts of these power plants, the ECHR ruled that their right to a fair hearing had been denied and that the Turkish state should pay compensation to the applicants. Following this decision, the Parliamentary Assembly of the Council of Europe called on Turkey to “either take the appropriate environmental measures or to close down these three power plants”.

If decision-makers in Turkey had listened from the outset to the civil-society actors who spoke with one voice to warn them of the dangers of coal, and had closed down or cleaned up these plants early on, the country could have minimized the costs it incurred and avoided future risks.

1977

- Foundations laid for the Yatağan Power Plant.



1979

- Yatağan-Eskihisar and Milas-Sekköy lignite mines go into operation.

1980

- Agreement signed with the Polish government to build the Yeniköy Power Plant (identified as the Sekköy Power Plant in the contract text).



1982

- First unit of Yatağan Power Plant goes into operation.
- Turkish Electricity Administration starts urgent expropriation process to build social facilities and a dock in the village of Ören, some 3-4 km away from the current location of the Kemerköy Power Plant.
- Villagers and the Milas Chamber of Agriculture file a complaint to the country's then-president and prime minister against the urgent expropriation process in Ören, bringing Kemerköy onto the public agenda for the first time.

1983

- Second unit of Yatağan Power Plant goes into operation
- High Coordination Board of Economic Affairs decides to build another 3x210 MW coal-fired power plant in Kemerköy.

1991

- Yatağan Environmental Association established to fight against the environmental pollution created by the coal-fired power plant.

- Second unit of Yeniköy Power Plant goes into operation.

1987

- First unit of Yeniköy Power Plant goes into operation.
- Foundations laid for the Kemerköy Power Plant.

- Villagers take non-violent direct action by lying down in front of the excavators and other heavy equipment brought in to build the Kemerköy Power Plant.

- Yatağan State Forestry Enterprises sues Turkish Electricity Administration on the grounds that the air pollution caused by the Yatağan Power Plant had caused forested lands to dry out.

1986

- Third unit of Yatağan Power Plant goes into operation.

- Women of Kemerköy block the bridge entering their village to keep out a team from the Turkish Electricity Administration who had come to do fieldwork for the power plant construction.
- A group of villagers from Kemerköy meanwhile travels to Ankara to file a complaint against the project.
- Petition campaign No to Kemerköy Power Plant is supported by local newspapers, the Bodrum Municipality, chambers of agriculture and commerce, and hunters' and tourism associations.
- The Kemerköy Power Plant is brought onto the agenda of the Turkish Parliament and politicians from different parties visit the region in support of the local people's objections to the project.

- Legal entities representing villagers in the area file a lawsuit with the Council of State against the Prime Ministry, on the grounds that it chose an inappropriate location for the Kemerköy Power Plant.
- Council of State dismisses the villagers' lawsuit.

1984

1993

- February 17: Radiation early warning system in Muğla alerted due to radioactive fallout created by the Yatağan Power Plant, which is shut down temporarily as a result.
- Hundreds of farmers file suit against the Turkish Electricity Administration, winning a compensation order totaling billions of Turkish Lira, over losses to their yields caused by environmental pollution from the Yatağan Power Plant.
- Volunteer environmental lawyers file administrative appeal to the Ministry of Health, the Ministry of Energy and Natural Resources, the Ministry of Environment, the Turkish Electricity Transmission Corporation and the Muğla Governorship, demanding closure of the Yatağan and Yeniköy Power Plants, and cancellation of the plans for the Kemerköy Power Plant.

- More than 7,000 people from Yatağan march in protest of the radioactive fallout created by the power plant.
- Members of a group in Muğla called "Mothers who love their children" organize protests and announce that they won't give birth to any more children until the power plant is closed down.
- March 8: Some 3,000 people – including local residents and environmental activists, associations and professional chambers from around the country – protest in the village of Ören against the Kemerköy Power Plant following a call by the Muğla Provincial Environmental Coordination Board.
- The Gökova Constant Action Group is founded by local communities and environmental associations in the region
- September 1: Members of the Gökova Constant Action Group travel to Ankara to object to the Kemerköy Power Plant, bringing sheep, lambs and turtles from their hometown with them.

1994

- First and second units of the Kemerköy Power Plant go into operation.
- Construction begins on the Yatağan Power Plant electrostatic filter unit, 11 years after the facility first became operational.

- West Mediterranean Environmental Platform established to unite environmental movements in the cities of Muğla, Denizli, Burdur, Isparta and Antalya.

- Following the non-response of the administrative authorities, three different cases are filed in the Aydın Administrative Court by volunteer environmental lawyers.

1999

- The Council of State's Administrative Law Chambers Assembly finalizes the decision to suspend and cancel the execution of power-plant operations, rejecting the defendant's request for rectification.

- Turkey's Supreme Court of Appeals upholds the decision of the Aydın Administrative Court to suspend and cancel the execution of power-plant operations.

1998

- The Yeniköy Power Plant is closed based on a decision by the Aydın Administrative Court, but reopened a day later when the court is overruled by the Council of Ministers.

1997

- July: An expert report is presented to Aydın Administrative Court, demonstrating the damage caused by the lack of flue gas treatment systems on all three power plants.
- August: Based on the expert report, the Aydın Administrative Court rules that all three power plants are polluting the environment and that their operations or construction should be suspended or cancelled.
- September: The Council of Ministers overrules the Aydın Administrative Court, allowing the power-plant operations to continue on the grounds that their closure would cause energy-supply constraints and loss of jobs, thereby affecting the region's tourism income.
- An appeal is made to the administrative authorities, requesting the implementation of court decisions, but subsequently rejected.
- Members of the Council of Ministers file a criminal complaint against power-plant managers and Turkish Electricity Transmission Corporation officials.
- Ankara Chief Public Prosecutor's Office dismisses the demand for prosecution for the prime minister and other ministers.
- Ten lawyers make individual applications to the European Court of Human Rights based on the non-enforcement of the court ruling against the power plants.

1996

- Third unit of the Kemerköy Power Plant goes into operation.

1995

Development of coal-fired power plants and coal mines

Actions by local communities and the ecology movement

Legal struggle

2000

- A privatization auction for the three power plants is held for the first time and a contract signed for the transfer of operating rights, though it could not be enacted due to local resistance and legal obstacles.
- The Yatağan Platform is established to bring together civil society organizations and local authorities.
- Some 6,000 people attend a demonstration in Yatağan, No to Environmental Pollution and No to Privatization of Coal-fired Power Plants, supported by 47 organizations, including the Yatağan Municipality, various trade unions, political parties, public institutions and nongovernmental organizations.
- The Turkish Medical Association publishes a report, "Assessment of Air Pollution in Yatağan," revealing that air pollution in the area was observed to be high enough to pose a danger to public health.

- Farmers carrying out agricultural activities around the Yatağan Power Plant open nine separate lawsuits, charging that the quality and quantity of their olive and tobacco production is being negatively affected by the ash and toxic gas emitted by the facility, therefore causing them to suffer material damage.
- The Yatağan Civil Court of Peace accepts the plaintiffs' claims and rules that material damages were caused.
- The decisions are finalized by the Supreme Court of Appeals.
- The governorship of Muğla shuts down the Yatağan Power Plant approximately 50 times from the beginning of 2000 until the end of 2001.
- The Yatağan Civil Court of First Instance recognizes claims by two citizens who had sued for damages, saying that the Yatağan Power Plant was damaging their mental and physical health. The court convicts the Turkish Electricity Transmission Corporation head office, ordering it to pay 500 million Turkish Liras (500 Turkish Liras in today's currency) to each claimant, but the decision is subsequently reversed by the Supreme Court of Appeals.

2004

- The investors' consortium of national and foreign companies that signed a contract for the transfer of operating rights of the three power plants in 2000 appeals for arbitrage to the International Chamber of Commerce over the failure to privatize the facilities, resulting in compensation from Turkey of US\$90.3 million with interest operation.

2005

- The European Court of Human Rights rules that the right to a fair trial was violated by the failure to implement judicial decisions, sentencing Turkey to pay 1,000 euros in compensation to each plaintiff.

2013

- An announcement is made that a fourth coal-fired power plant will be built in the region, in the Karacahisar village of Milas.
- August: A decision is made to privatize the Yatağan, Yeniköy and Kemerköy Power Plants, along with their immovable assets, and both movable and immovable assets used by the South Aegean Lignite Pits and Yeniköy Lignite Pits, through the "Asset Sale" method; and the Kemerköy Port Area as a whole, along with 12 mining licenses belonging to the sites that provide coal to these power plants and the mining sites comprised by these licenses, through the "Transfer of Operating Rights" method.
- November: Privatization auction launched for all three power plants and mining sites.
- The organization Karacahisar Volunteers initiates resistance against the planned Karacahisar project, working with national-level NGOs.

2012-14

- Hundreds of millions of Turkish Lira are transferred from the public budget within the scope of Public Investment Programs to rehabilitate the electrostatic and flue gas desulphurization facilities of the Yatağan and Yeniköy Power Plants, and the generator of the Yeniköy Power Plant.

- The Ministry of Health commissions research by the Muğla Provincial Health Directorate on cancer cases in Yatağan, but the final report on the results of the study is labeled "confidential" and released only for ministerial use.
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2012

- A flue gas desulphurization facility is commissioned for the Yatağan Power Plant, 25 years after it was established.

2008

- A flue gas desulphurization facility is commissioned for the Yeniköy Power Plant, 21 years after it was established.

2007

- A flue gas desulphurization facility is commissioned for the Kemerköy Power Plant, 12 years after it was established.

2006

2014

- May: ANT Energy Industry Trade and Limited Company (Çalık Energy I.C.), receives an approved Environmental Impact Assessment report for its Ant Energy Thermal Power Plant Project, a coal-fired facility with 1x160 MW installed power capacity in the Kırkköy area of Yatağan.
- December: Contracts to sell and transfer the operating rights for all three power plants are signed, with Yatağan Power Plant and its coal mines transferred to Bereket Enerji I.C.; and Yeniköy and Kemerköy Power Plants and their coal mines, along with the Kemerköy Port Area transferred to the İC İctaş-Limak I.C. consortium under the YK Energy Production I.C.

- Workers at the Yatağan, Yeniköy and Kemerköy Power Plants and associated mines, and the unions representing them, continue sustained anti-privatization actions with strong public support in Muğla, Yatağan, Milas and Ankara from February to December, when the transfers are approved.

2015

- Exploratory and project development field studies are conducted for the lignite reserves in Karacahisar, Milas, by the General Directorate of Mineral Research and Exploration, Turkish Coal Enterprises and YK Energy Production I.C.

2016

- A worker dies by falling into the Yatağan Power Plant's ash silo.
- The Provincial Directorate of Food and Agriculture issues a response to the complaint made by the Turgut Association for Social Aid, the Protection of Cultural and Natural Assets over the illegal cutting of olive trees by the plant operator in order to expand the coal mine. The response confirms that this destruction was unauthorized, and that administrative action was taken due to the violation of Article 20 of Law No. 3573 on Improvement of Olive Cultivation and Inoculation of Wild Varieties.

2017

- The Turgut Association for Social Aid, the Protection of Cultural and Natural Assets initiates active resistance against lignite mine expansions with the support of Turgut villagers and the Muğla Environmental Platform.
- The Provincial Food, Agriculture and Livestock Directorate determines during a field visit to Turgut village that 1,483 olive trees on 35 parcels had been cut without permission for coal mining operations since 2013.

2018

- The Muğla Provincial Directorate of Environment and Urbanization decides that an Environmental Impact Assessment report is not required for the underground coal mine project planned in Yatağan's Hacıbayramlar district.
- Conveyor belts carrying coal to the Yatağan Power Plant collapse, killing two workers and injuring more than 10.
- Environmental Impact Assessment process initiated for a new, open-pit coal mine license area of 167 hectares to be operated in Yatağan.
- January: The Milas City Council organizes an "Energy Panel" against the lignite mine expansions in Milas's Gereme district with the participation of Yatağan residents and other local communities in the Milas region.
- March: Residents of the Karadam neighborhood refuse to leave their villages, which are planned to be expropriated for the expansion of the İkizköy lignite field in Milas.

- The Muğla Provincial Food, Agriculture and Livestock Directorate announces that administrative fines will be levied against the company operating the Yatağan Power Plant and coal mines for cutting the olive trees in Turgut village without permission.
- Turgut villagers file a lawsuit with the Yatağan Criminal Court of First Instance over the Yatağan Thermal Energy Production I.C.'s illegal intervention in the village's olive groves.
- The Turgut Association for Social Aid, the Protection of Cultural and Natural Assets files complaints to the Ministry of Environment and Urbanization, the Muğla governorship, and the Muğla Provincial Directorate of the Ministry of Environment and Urbanization about the coal mines not complying with the "health protection strip" rule.
- August: Volunteers with the Turgut Association for Social Aid, the Protection of Cultural and Natural Assets file a lawsuit against the decision not to require an Environmental Impact Assessment report for the mine expansion project in the Hacıbayramlar neighborhood.
- September: Residents of Turgut and Yatağan object to the project development file for the new coal mine license area, which was presented to the Ministry of Environment to initiate the Environmental Impact Assessment process.

Sources:

- 1) From the archives of the Official Gazette; retrieved on 23 October 2018. <http://www.resmigazete.gov.tr/>;
- 2) From the archives of Milliyet newspaper; retrieved on 23 October 2018. <http://gazetearsivi.milliyet.com.tr/>;
- 3) "Gökova'da Bir İnat Abidesi [A Stubborn Monument in Gökova]," Nazmi Kozak, *Anatolia Turizm Araştırmaları Dergisi [Anatolia Tourism Research Magazine]*, Book:4, Number:1, 1993, Ankara. <https://www.anatolijournal.com/atad/?sayfa=dergi&sayi=1&yil=1993&lang=tr>; retrieved on 23 October

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- 4) "Yatağan Termik Santrali Etki Alanındaki Turgut Köyü Hak İhlalleri Raporu [Report on Rights Violations in Turgut Village in the Impact Area of the Yatağan Coal-Fired Power Plant]," *Ekoloji Kolektifi Derneği [Ecology Collective]*, May 2018, Ankara. <http://ekolojikolektifi.org/portfolio/yatagan-termik-santrali-etki-alanindaki-turgut-koyu-hak-ihlalleri-raporu/>; retrieved on 23 October 2018
- 5) Personal interviews with the people of Yatağan-Turgut and Milas-Karacahisar. Date: February to July 2018.



CONCLUSION AND RECOMMENDATIONS

The coal that is extracted and burned in the Muğla region is a low-quality lignite with a high content of dust and sulphur. The extraction and burning of this lignite, and the disposal of the combustion ash and waste that result from this process, come with a serious cost for both people and the environment. However, outside of the coal sector, Muğla has many opportunities for a different kind of economic growth that would offer a higher quality of

life, giving it great potential for high-value-added regional development. If policies to break Turkey's dependence on coal were to be implemented, Muğla would be well-suited for a social transformation, and just transition, that would enable non-coal employment and development. According to the analysis of current official data carried out in the preparation of this report, Muğla's agricultural production, aquaculture and tourism are among the priority sectors



in the short term. Renewable energy, organic agriculture, ecologic tourism and medical and aromatic plant production are all sectors with as yet undeveloped potential for growth.

Muğla's coal-fired power plants are at a turning point. In addition to their heavy ecological and social costs, including their contributions to the global climate crisis, they are near retirement age and cannot function properly without government subsidies that burden the economy. Moving away from extracting and burning coal, and transitioning to a low-carbon development model would have noticeable benefits on the local, regional, national and international level. It is possible for Turkey to immediately abandon its plans to build dozens of additional coal-fired power plants, and to shut down its operational facilities in a planned fashion, starting with the oldest plants. Though the ecological and social damage that has been done by coal cannot be fully remedied, further damage can be avoided by transitioning to a real sustainable development model based on the region's broader potential and taking into account the community's preferences and the local way of life. Successful planning for a post-coal future requires prioritizing the following steps:

- Presenting regional and national plans that will enable transition in energy production from coal to sustainable, citizen-centered renewable energy resources;
- Ensuring this transition to be equitable for all communities: The approximately 5,000 existing coal workers, and their families, in Aydın, Denizli and Muğla must be

rehabilitated, retrained, and provisions made to meet the needs of their families.

- Sharing the true extent of the pollution that has been accumulating in the region for the past 40 years (the total pollution load) with the public, starting from health experts and local communities;
- Continuous monitoring of the environmental performance indicators of existing coal mines and coal-fired power plants, by the supervising state institutions, ensuring that these facilities abide by all regulations until they are closed down; and making sure the monitoring reports are publicly accessible -as it is defined by law;
- Promoting public-health monitoring studies in this region, which has been significantly impacted by industrial pollution;
- Incorporating coal transportation facilities, power-plant waste facilities, and other facilities related to the coal infrastructure, in the Environmental Impact Assessment (EIA) processes for Muğla's coal mines and coal-fired power plants -adopting a holistic approach;
- Immediately ending further expansion of new coal mines, in the designated license areas;
- Planning a gradual closure of Yatağan, Yeniköy and Kemerköy power plants at their retirement age, and a transformation of the coal regions with their inhabitants, instead of costly renovation investments;
- Shifting the public budget, allocated for coal exploration and production subsidies, to citizen-centered renewable energy projects and adaptation to climate change impacts in the region.



"I arrived to this village when I got married 65 years ago. Where should I go now? How can one start a new life at this age?"
Feriştah, Ekizköy, Milas

THE REAL COSTS OF COAL- MUĞLA RESEARCH FINDINGS

Some subsidy items specific to Yatağan, Yeniköy and Kemerköy coal-fired power plants were analyzed (where actual data was available) for **THE REAL COSTS OF COAL**. They are the following:

Each of the three coal-fired power plants benefit from Customs Duty Exemption, Tax Reduction, Social Security Premium Support (Employer's Share), Land Allocation and Interest Support through the "prioritized investments" scheme on the grounds that they produce electricity from domestic resources. The fact that these taxes, which are important national fiscal resources, are not paid brings about an important cost;

In 2017, 30% of the total electricity purchased pursuant to the guaranteed fixed-price scheme handed to power companies that produce electricity from domestic resources amounted to 1.10 billion Turkish lira and was purchased from Yatağan, Yeniköy and Kemerköy coal-fired power plant operators;

The capacity allowances, which were paid to these three coal power plants to enable them to keep a certain capacity in operation pursuant to the Regulation on the Electricity Market Capacity Mechanism that entered into force in January 2018, cost the state budget approximately 134 million TL between January-December.

According to the Archaeology Foundation's analysis for **THE REAL COSTS OF COAL** on the mine licensing areas and pollution dispersion maps:

There are many registered archaeological sites within the boundaries of areas that were awarded lignite extraction permits. The archaeological sites that are the most affected by coal extraction fields are the ones located between Stratonikeia and Lagina, two cultural heritage sites with ongoing archaeological surveys. The ancient city of Stratonikeia is also a Unesco World Heritage candidate;

If the licensed coal extraction fields that are located within the existing archaeological site area become operational, it will prevent the adoption of a holistic conservation approach for natural and cultural assets and will disrupt the relationship between archaeological sites and their natural environment;

Polluting emissions from the chimneys of these three coal-fired power plants have negative impacts not only on human health, but on cultural assets as well;

The air pollution dispersion model study for THE REAL COSTS OF COAL, covers the archeological sites that can be adversely impacted by pollution within the limits of the province of Muğla. According to the model, the impact area of the Yatağan, Yeniköy and Kemerköy coal-fired power plants encompasses 880 archaeological sites, including first and third degree archaeological sites with ongoing research.

According to **THE REAL COSTS OF COAL'S** contributing report "The Impacts of the Three Coal Power Plants and Open-pit Lignite Mining Operations to Forest Ecosystems in the Province of Muğla" by Association for the Research of Rural Environment and Forestry Issues:

With the 13 mine operating licenses awarded to the private sector in 2014, 21,000 hectares are allocated to lignite mines in Yatağan and 23,000 hectares in Milas;

Forest areas account for 47.4% of operating license areas. The regional forest ecosystem includes the dominant Turkish pine, as well as 55 mostly woody plant species (trees and shrubs). These forests have many nature-related and social functions such as nature conservation, gene conservation, seed and wood production, maintaining the hydrological cycle and ecotourism;

Since 1979, open-pit lignite mining activities spread over a total area of approximately 5,000 hectares (equivalent to 7,800 soccer fields). Quantitative data regarding forest and agricultural areas that were destroyed in this context is not accessible;

If all the licensed areas become operational in the course of the next 30 years, an additional 11,200 hectares of forest area in Milas and 7,250 hectares in Yatağan will be wiped out, amounting to the destruction of a total area equivalent to 30,000 soccer fields. If lignite is extracted from the entire licensed area, it will impact the ecosystem integrity of an area larger than the one in question; animals, plants and other living species, which live in these physically damaged habitats that are exposed to mining-related pollution and where the groundwater regime is disturbed, will be adversely affected and biodiversity will decline;

Forest ecosystems are impacted also by the environmental pollution caused by the coal-fired power plants in the region. For example, the ash dams, which store the solid and liquid hazardous wastes from all three power plants occupy a total forest area of 300 hectares (equivalent to 470 soccer fields). These ash dams are not equipped with any infrastructure that can prevent the hazardous waste from contaminating neither ground and surface waters, nor soil and air.

According to Professor Doğanay Tolunay's calculations for **THE REAL COSTS OF COAL** research,

in the event that the forest ecosystems within the boundaries of Yatağan and Milas coal mining lease areas are entirely destroyed for coal mines, the loss of biomass, soil, above ground dead organic matter and dead wood will lead to a carbon sink area loss equivalent to 9 million tons of carbon dioxide. The projected estimate for total carbon loss from the destruction of carbon sinks is 66,200 tons of CO₂e per year. Calculations show that 30 years of mining activity will lead to a total carbon loss of 2 million tons of CO₂e.

The report card on the carbon emissions of Muğla's three coal-fired plants is pretty grim.

The coal burnt to generate electricity in power plants in Yatağan, Yeniköy and Kemerköy emitted a total of 360 million tons of atmospheric carbon dioxide. Currently, there still are no economically feasible technologies to capture carbon dioxide before it is emitted to the atmosphere. Hence, we will all globally bear the burden of burning coal even after the upgrade investments planned for Yatağan, Yeniköy and Kemerköy coal-fired power plants: if these power plants continue to operate until 2043, they will an additional 328 million tons of carbon dioxide.

According to the modelling study conducted by Lauri Myllyvirta for **THE REAL COSTS OF COAL**, coal in Muğla imposes a very heavy burden on human health:

Currently, air pollution from coal-fired power plants causes 280 premature deaths per year; and a total of 61,000 disease and premature death-related job losses.

The total number of premature deaths caused by the three coal-fired power plants in Yatağan from the time when the first coal-fired power plant became operational in 1983 until the end of 2017 is estimated to be 45,000;

If every coal-fired power plant remains operational for 50 years, the air pollution they cause will lead to 5,300 additional premature deaths, even if environmental investments comply with regulations.



Climate Action Network (CAN) Europe is Europe's leading NGO coalition fighting dangerous climate change. With over 150 member organizations from 35 European countries, representing over 40 million citizens from the European Union, the Balkans and Turkey, CAN Europe promotes sustainable climate, energy and development policies throughout Europe. In Turkey, CAN Europe currently has four civil society organization members and provides support to civil society coalitions such as İklim Ağı (Climate Network) and Temiz Hava Hakkı Platformu (Clean Air Rights Platform) as an observer.

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