



Relapsing

Fortum buying into Uniper makes it one of Europe's most polluting power companies

About this briefing

This briefing is an initiative of the Europe Beyond Coal campaign.

It builds on the findings and methodology published in the report 'Last Gasp: the coal companies making Europe sick', November 2018, by the Europe Beyond Coal campaign, under the responsibility of Climate Action Network Europe.

The individuals who contributed to it include:

Greenpeace Nordic: Rosa Gierens (atmospheric modelling), Lauri Myllyvirta (lead author and Head of Greenpeace Air Pollution Unit, health impact analysis)

Europe Beyond Coal: Kaarina Kolle (lead author), Greg McNevin (producer)

The health impact methodology used in the 'Last Gasp' report is guided by recommendations from the World Health Organization Europe's 'Health risks of air pollution in Europe' (HRAPIE) project on health impact assessments for air pollution. It includes atmospheric modelling with the European Monitoring and Evaluation Programme Meteorological Synthesizing Centre - West (EMEP MSC-W) computer model, which is also used by the European Environment Agency for European Commission assessments of health impacts from air pollution in Europe. They are based on publicly available, relevant data known of by the authors; this data may not be exhaustive and there may exist further or updated information they were not aware of at the time of writing. This briefing does not attempt to quantify actual health occurrences nor their actual costs.

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Executive Summary

Finnish state-owned power generator Fortum has become one of Europe's 10 worst polluting power companies through its acquisition of the coal-fired assets of Uniper, based on health impact modeling by the Greenpeace Global Air Pollution Unit.

This report finds that Fortum, through its new near majority ownership of Uniper, is taking on responsibility for coal plants that caused an estimated 316 premature deaths and EUR340 million in health costs in 2016 alone. Since the latest available data is from 2016, before Fortum had invested in Uniper, Fortum's new responsibility can only be calculated from then.

This modelling shows that through its newly increase stake in Uniper, Fortum will be taking on responsibility for a modelled 131 new cases of chronic bronchitis, and 5,418 asthma symptom days in children annually, and the mentioned 316 premature deaths. This leads to an estimated 5,419 hospital admissions and 229 lost working days. The calculations are adjusted to Fortum's most recently announced ownership of Uniper (49.9%¹).

When the pollution caused by Uniper is accounted towards Fortum's own emissions, it becomes one of the most polluting companies in Europe. This is hardly surprising as Germany, Uniper's home base, is struggling to break its addiction to coal on a fast enough trajectory. Furthermore, while Fortum's business strategy is rooted in clean energy solutions, the company still has several polluting coal assets of its own that have adverse health impacts also in Finland and beyond. With these results, Fortum becomes the ninth most polluting power company within the 'toxic ten' coal polluters identified in the report² *Last Gasp*.

Table 1 2016 Modelled health impacts of Fortum, including the company's share in Uniper-owned coal plants

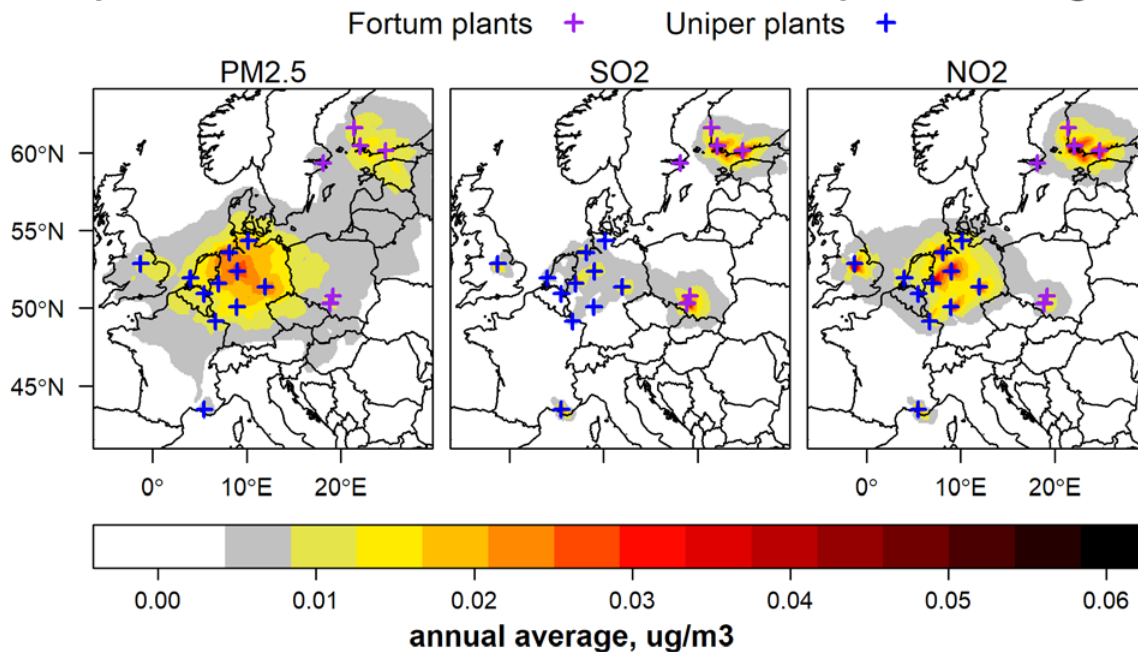
Effect	Fortum Plants	Fortum through Uniper	Total	95% confidence interval ³	Unit
Premature deaths	56	260	316	(196 - 432)	cases per year
Chronic bronchitis (adults only)	24	107	131	(46 - 204)	new cases per year
Hospital admissions	871	4548	5419	(1,037 - 9,774)	cases per year
Lost working days	43	186	229	(205-258)	worker-years per year
Asthma attacks in children	871	4548	5418	(1,159 - 9,786)	cases per year
Health costs, high	65	271	336	(119 - 525)	MEUR

1 Fortum Oyj CEO Pekka Lundmark on Q4 2018 Results - Earnings Call Transcript, February 2019. Access at - <https://seekingalpha.com/article/4237593-fortum-oyj-fojcf-ceo-pekka-lundmark-q4-2018-results-earnings-call-transcript>

2 Last Gasp - The coal companies making Europe sick, 2018. Access at - <https://beyond-coal.eu/wp-content/uploads/2018/11/Last-Gasp-2018.pdf>

3 It gives an estimated range of values which is likely to include an unknown population parameter, the estimated range being calculated from a given set of sample data

Air pollutant concentrations from Fortum coal power holdings



The largest number of premature deaths associated with Fortum/Uniper's emissions occur in Germany, with 120 deaths per year, followed by the UK, France and Poland. The largest contributions to PM2.5 pollution take place around power plants in Rheinland and Northern Germany, while the largest contribution to NO2 pollution is on the Finnish coast around the Naantali power plant.

The study makes recommendations for Fortum/Uniper, the Finnish government and the financial institutions associated with these companies

Fortum must:

- Publish a clearly articulated and detailed roadmap for the gradual closure (not sale) of existing coal plants of both companies, ending at the latest in 2030 - despite the phase-out date of 2038 set by the German Coal Commission.
- Not sell its coal plants but rather take responsibility for closing them, and closure dates should be announced to plan for a just transition.
- Force Uniper to put an immediate end to capital expenditure into Datteln 4 and any form of lifetime extension for existing coal plants. Datteln should not be allowed to operate - as has been recommended by the German Coal Commission.⁴

The Finnish government must:

- Immediately update the Finnish Government's Resolution on State-Ownership Policy to align business plans and practices with the goal of limiting global warming to 1.5°C (covering scopes 1-3) - with an explicit clause to discourage selling of high-carbon assets instead of closing them.

Fortum's shareholder must:

- Robustly engage with Fortum and Uniper through their ownership of the company and ensure the companies genuinely contribute towards compliance with the Paris Climate Agreement aim of temperature rises not exceeding 1.5°C.

⁴ Abschlussbericht: Kommission "Wachstum, Strukturwandel und Beschäftigung", January 2019
https://www.handelsblatt.com/downloads/23912864/3/190126_abschlussbericht_kommission-wachstum-strukturwandel-und-beschaeftigung_beschluss.pdf?ticket=ST-408630-ukON3XmWfR0126mz1ZFH-ap1

Introduction

Coal has proven to be a precarious fuel to be associated with. Air pollution from coal-fired power plants is linked with a plethora of ailments undermining public health. Toxic pollutants from the burning of coal such as sulphur oxides (SO_x), nitrogen oxides (NO_x), and particulate matter (PM) have detrimental effects on public health.

Alongside with the human health impacts, we are fortunately witnessing collapse of hard coal plants' profitability. With many coal companies hemorrhaging due to regulations and competition from cheaper fuels cutting into their profit margins the situation has led to coal and carbon prices rising faster than the cost of electricity. There is a growing consensus amongst leading financial institutions globally that the world is moving towards a low carbon economy, and that as a result, coal power assets will be stranded, and constitute growing financial and reputational risks. The diminishing social licence of coal to operate is underpinned by the climate science, which calls for closures in Europe for 2030. This timeline has been put forward by the International Energy Agency and is increasingly demanded by coalitions of responsible investors⁵ - including the Finnish Pension Fund Elo.

However, while it is clear that coal is inevitably on its way out, any delay in the phase-out is not only a disaster for the climate but any lingering is also putting the health of Europeans at risk. For these reasons, it is time for Fortum, the Finnish state and the financial institutions to take responsibility for the coal assets and close them by 2030 or earlier.

⁵ Investors push power companies to end coal use by 2030. The Financial Times (December 2018). Access at - <https://www.ft.com/content/1c65952e-03a4-11e9-99df-6183d3002ee1>

Fortum and Uniper

Company overview

The state-owned Fortum is the largest single owner of the German company Uniper (currently at 49.9%). As from 30 June 2018, Fortum has consolidated Uniper as an associated company. The two companies' strategies differ significantly: Uniper's business model largely revolves around fossil-based energy. Fortum's company strategy, on the other hand, is mostly based on a low-carbon energy system. However, despite this, Fortum still has an operational coal fleet of its own.

Both Fortum and Uniper are still operating coal plants. Uniper's coal plants in the UK, Netherlands and France account for around half of the pollution impacts; national government coal phase-out plans mean these plants will eventually retire. Uniper's coal plants are scattered throughout Western Germany. Even in the aftermath of the Coal Commission's announcement, Uniper has not yet announced any plans to close any of them.

Fortum's coal plants are located in Russia⁶, Poland, Sweden and Finland⁷. The Finnish plants will eventually be closed due to the Finnish coal ban. However, the future of most of the plants remains unclear.

The CEO of Fortum, Pekka Lundmark. Under his leadership Fortum has acquired 49.9 % of Uniper's shares



© Arno Mikkor / Fortum

⁶ Emissions from the Russian power plants not modelled in this study

⁷ Read more about the plant-by-plant composition here: https://beyond-coal.eu/wp-content/uploads/2018/12/EBC_Fortum_Uniper_briefing_paper.pdf

Fortum's largest shareholders must shoulder their responsibility: the Finnish government and the financial institutions

Investments in coal carry real financial risks for banks, insurers and investors. Furthermore, it is the fiduciary duty of any investor - including the Finnish state - to serve the best interest of its beneficiaries. Ultimately, that means the ordinary Finnish people.

Fortum is a listed company with the Finnish government being the largest owner with 50.76% share. As a consequence, the company has to abide by the Finnish Government's Resolution on State-Ownership Policy that states: *in its decision-making, a company must take into account the economic factors and the social and environmental impacts of its activities.*

Besides the state, the largest shareholders of Fortum are primarily the large Finnish pension funds. Furthermore, many financial institutions are also Fortum's creditors through underwriting and loans. The detailed data of the financial ties to Fortum are detailed in Annex 1. Additionally, a large number of shares is owned by The Social Insurance Institution (Kela) - a government agency in charge of several health-related functions in Finland.

Several Finnish financial institutions are also members of the Climate Action 100+ Initiative⁸ that involves over 320 investors collectively representing \$33 trillion in assets. The coalition's purpose is to pressure high-emitting companies to change. Fortum⁹ has been listed as one of the focus companies by the initiative. Therefore, the onus is on the financial institutions to publicly intervene and engage with the company. Those Finnish investors, banks and insurers who are part of the initiative must now step up and assertively demand the coal plant closures.

The financial institutions are also change agents: the responsible investors play a pivotal role in shaping the company behaviour through engagement and reallocation of capital. This can in turn positively influence decisions on how utilities are run and whether the management steers the company in the right direction.

⁸ <http://www.climateaction100.org/>

⁹ *ibid.*

Since 2016...

While Europe as a whole has been reducing coal-fired power generation, Uniper continues to expand its capacity with Datteln 4 planned to be completed in 2020 - these health impacts are therefore not modelled. Uniper has retired several older plants.

Some of Fortum's domestically operated coal plants have moved 308 MW of Meri-Pori as peak load to reserve capacity for the period 1 July 2017 - 30 June 2020¹⁰. However, the Zabrze II plant was added to grid in Poland in 2018¹¹.

Uniper has started the disposal of its coal plants in France and initiated the talks with the Czech utility EPH¹². The privately owned EPH is come to be known for scooping up unwanted plants from big power companies that are switching to other forms of generation.

26 January 2019, the German Coal Commission released the long awaited coal phase out proposal which suggests to close by 2022 12.5 GW of coal power plants and coal-fired power generation by 2038 with an option to end it by 2035. The German government has now started a process of putting a phase out into law, building on the coal commission outcomes. This has profound impacts on the utilities operating coal power plants in Germany. At the initial phase of the phase-out RWE and Uniper have the most at stake, which makes the detailed closure plans increasingly material to disclose. Most importantly, if the German government follows the Commission's recommendations, Datteln 4 will become a clear example of a stranded asset.

In February 2019, the Finnish Parliament approved a ban on coal-fired power and heating generation to enter into force in May 2029. This means that if Fortum will not endorse the same deadline for its operational fleet, it is out of step with the timeline set by its largest shareholder - the Finnish government.

Therefore, through its 49.9% ownership of Uniper, Fortum has a central role to play.

¹⁰ Access at - <https://www.energjavirasto.fi/web/energy-authority/-/he-energy-authority-is-purchasing-729-mw-as-reserve-capacity>

¹¹ Our power plants: Zabrze CHP plant Access at: <https://www.fortum.com/about-us/our-company/our-energy-production/our-power-plants/zabrze-chp-plant>

¹² Uniper's website, December 2018. Access at <https://www.uniper.energy/news/uniper-and-eph-enter-into-exclusive-negotiations-for-the-sale-of-unipers-activities-in-france/>

Health Impacts

Methodology

Detailed atmospheric modeling on the impacts of Fortum and Uniper emissions on air quality across Europe was carried out using the EMEP MSC-W atmospheric chemical-transport model, developed by European meteorological institutes under the Convention on Transboundary Air Pollution (CLRTAP). The MSC-W is an advanced chemical-transport model that simulates air quality across Europe using spatial data on emissions from all different sectors and sources, along with three-dimensional time series data on meteorological variables such as wind speed and direction, temperature, humidity and precipitation, and land use, topographical and other relevant geophysical data. The model is developed continuously and validated yearly by comparing predicted total pollution levels and pollution composition to measurements at dozens of ground stations. All used datasets and meteorological data are for the year 2013.

The emission data for the studied coal-fired power plants was obtained from the E-PRTR database which is based on emission reports by national authorities.

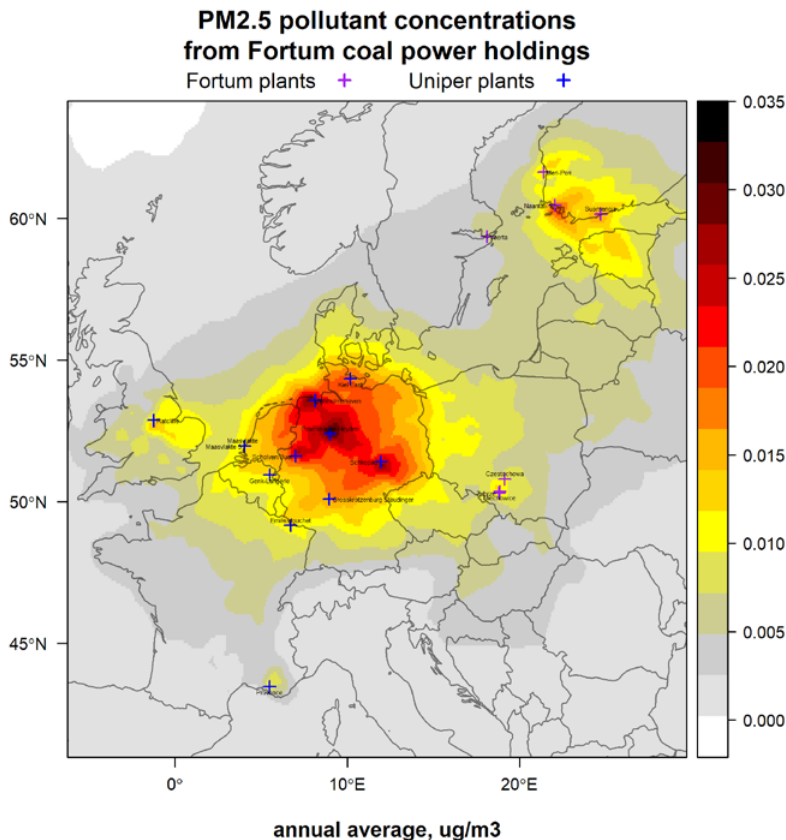
Assessment of health impacts follows the recommendations of WHO for health impact assessment of air pollution given in the HRAPIE project, as implemented in Huscher, Myllyvirta & Gierens (2017)¹³. For each health effect modelled, data on air pollutant concentrations derived from the atmospheric modeling is combined with a high-resolution gridded population dataset, information on current incidence of the health issue (e.g. death rate, number of asthma attacks) in each country, and concentration-response relationships derived from epidemiological studies, to obtain the number of cases of the health impact that can be attributed to Fortum's emissions.

13 Huscher, Myllyvirta, Gierens 2017: Modellbasiertes Health Impact Assessment zu grenzüberschreitenden Auswirkungen von Luftschadstoffemissionen europäischer Kohlekraftwerke. Umweltmedizin - Hygiene - Arbeitsmedizin Band 22, Nr. 2 (2017) <https://www.ecomed-umweltmedizin.de/leseproben/self/umweltmedizin--hygiene--arbeitsmedizin-band-22-nr-2-2017-.pdf>

Findings

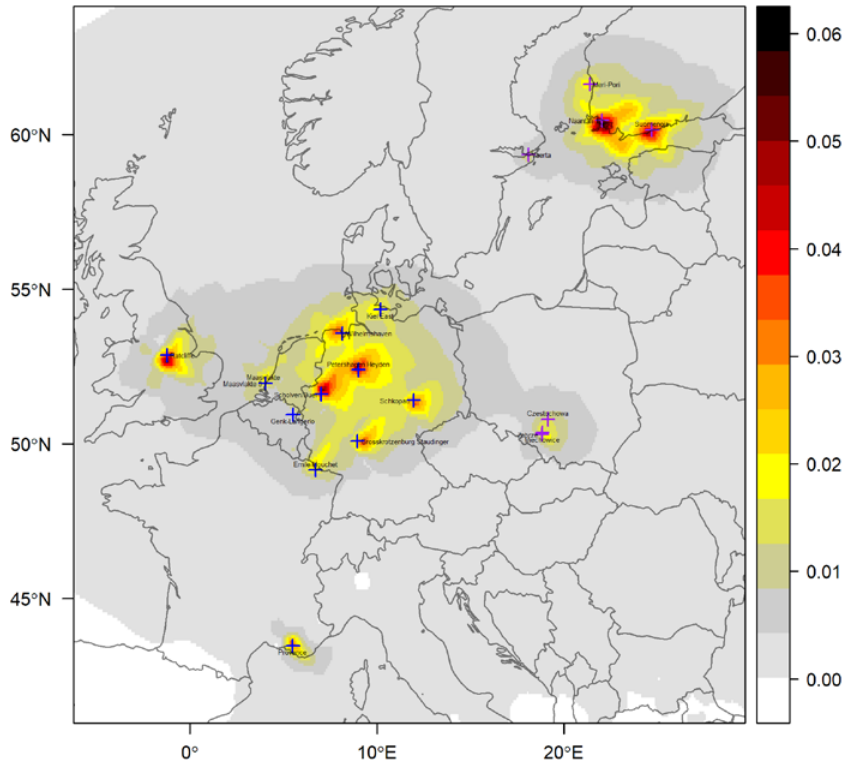
Air pollution from Fortum/Uniper coal power plants travels hundreds of kilometers, affecting air quality in health not only in countries where they are located but also in neighboring countries. The largest public health impact in 2016 took place in Germany, United Kingdom, France and Poland, due to both relatively large air quality impact and large populations exposed.

Table 2 2016 Modelled premature deaths by country		
Country	Total	95% confidence interval
Germany	122	(77-195)
United Kingdom	36	(23-61)
France	24	(15-37)
Poland	24	(15-37)
Netherlands	19	(12-31)
Russia	14	(9-20)
Belgium	10	(7-16)
Ukraine	8	(5-11)
Czech Republic	7	(5-11)
Finland	6	(4-10)
Others	45	(28-65)
Total	316	(199-494)



**NO2 pollutant concentrations
from Fortum coal power holdings**

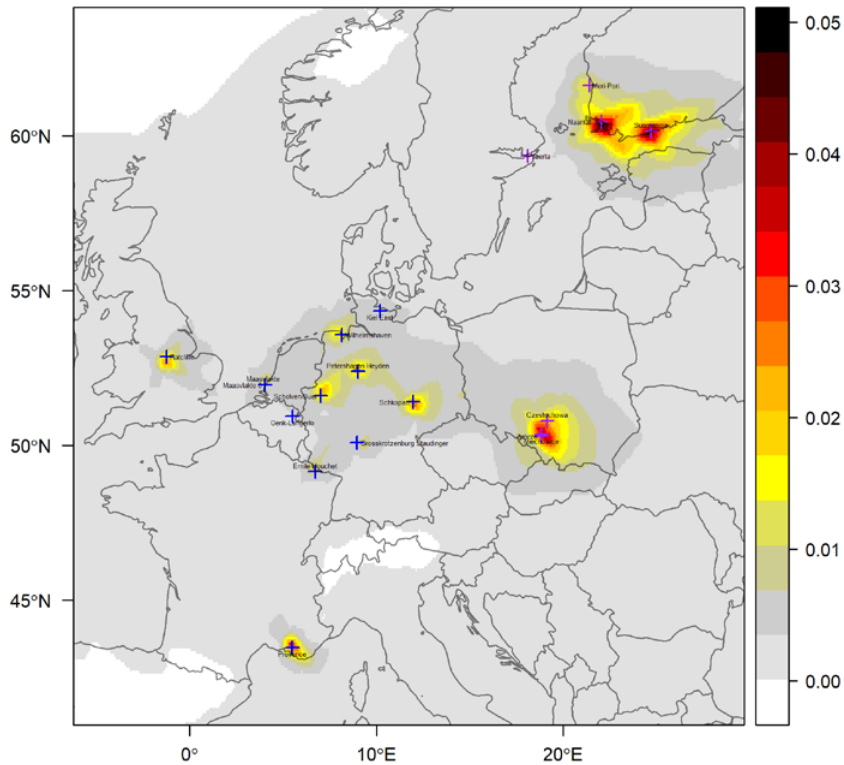
Fortum plants + Uniper plants +



annual average, ug/m3

**SO2 pollutant concentrations
from Fortum coal power holdings**

Fortum plants + Uniper plants +



annual average, ug/m3

How do these pollutants impact human lives?

Ambient air pollution is the largest environmental health risk in the world and in Europe, reducing average global life expectancy by almost two years. PM2.5, ozone and NO2 are the pollutants responsible for the largest impact on public health.

The World Health Organization (WHO) says that no level of air pollution can be considered 'safe'¹⁴ and the link between air pollution and respiratory and cardiovascular diseases is well-established¹⁵. Breathing in particulate matter, even at low levels, can lead to physiological changes in the body that damage health. The biggest impact of particulate matter on health is from long-term exposure, which increases the risk of premature death, particularly from conditions affecting the heart and blood vessels. However, poor air quality is also linked to chronic and acute respiratory diseases, which significantly degrade quality of life, such as bronchitis and the aggravation of asthma.

Scientists continue to identify new ways that air pollution can harm our health, for example, there is increasing evidence linking air pollution to dementia¹⁶ [5] and new evidence has shown that particles of air pollution travel through pregnant women's lungs and lodge in their placentas, harming babies before they are born¹⁷.

Around 80% of premature deaths associated with the emissions from coal-fired power plants in Europe were caused by exposure to PM2.5¹⁸. Coal plants contribute substantially to the formation of PM2.5 via their emissions of sulphur dioxide (SO2) and nitrous oxides (NOx), which react with ammonia to form PM2.5 in the atmosphere; but also, less so, via direct emissions into the air. Coal power plants were responsible for 26% of all SO2 emissions and 8% of all NOx emissions across Europe in 2016¹⁹.

14 See page 1 of: http://www.euro.who.int/__data/assets/pdf_file/0004/193108/REVIHAAP-Final-technical-report-final-version.pdf

15 WHO/Europe. Review of evidence on health aspects of air pollution – REVIHAAP Project. <http://www.euro.who.int/en/health-topics/environment-and-health/air-quality/publications/2013/review-of-evidence-on-health-aspects-of-air-pollution-revihaap-project-final-technical-report>

Royal College of Physicians - Every breath we take: the lifelong impact of air pollution. <https://www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution>
The European Respiratory Society/The European Lung Foundation. The European Lung White Book. <https://www.erswhitebook.org/chapters/outdoor-environment/>

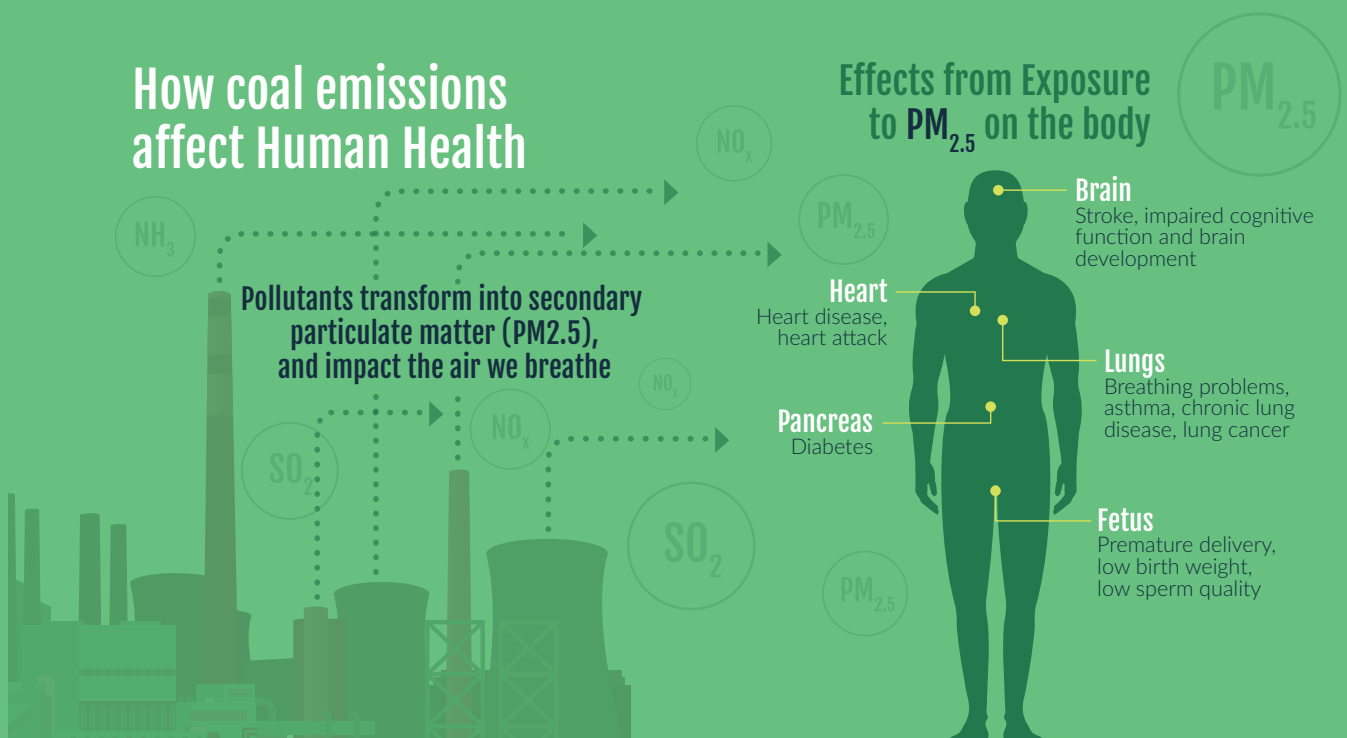
16 <https://blogs.bmj.com/bmjopen/2018/09/18/air-pollution-may-be-linked-to-heightened-dementia-risk/>

17 <https://www.theguardian.com/environment/2018/sep/16/air-pollution-particles-found-in-mothers-placentas>

18 Moore C et al 2018: Last Gasp – The coal companies making Europe sick. Europe Beyond Coal, Sandbag, EEB, Greenpeace and CAN Europe.

19 The coal plants had emissions of 617,000t SO2 and 612,000t NOx, compared to economy-wide emissions of 2.4Mt and 7.6Mt respectively, according to EUROSTAT (all 2016 figures).

How coal emissions affect Human Health



Conclusions

Fortum, the Finnish government and those financial institutions associated with Fortum, now have a chance to do the right thing.

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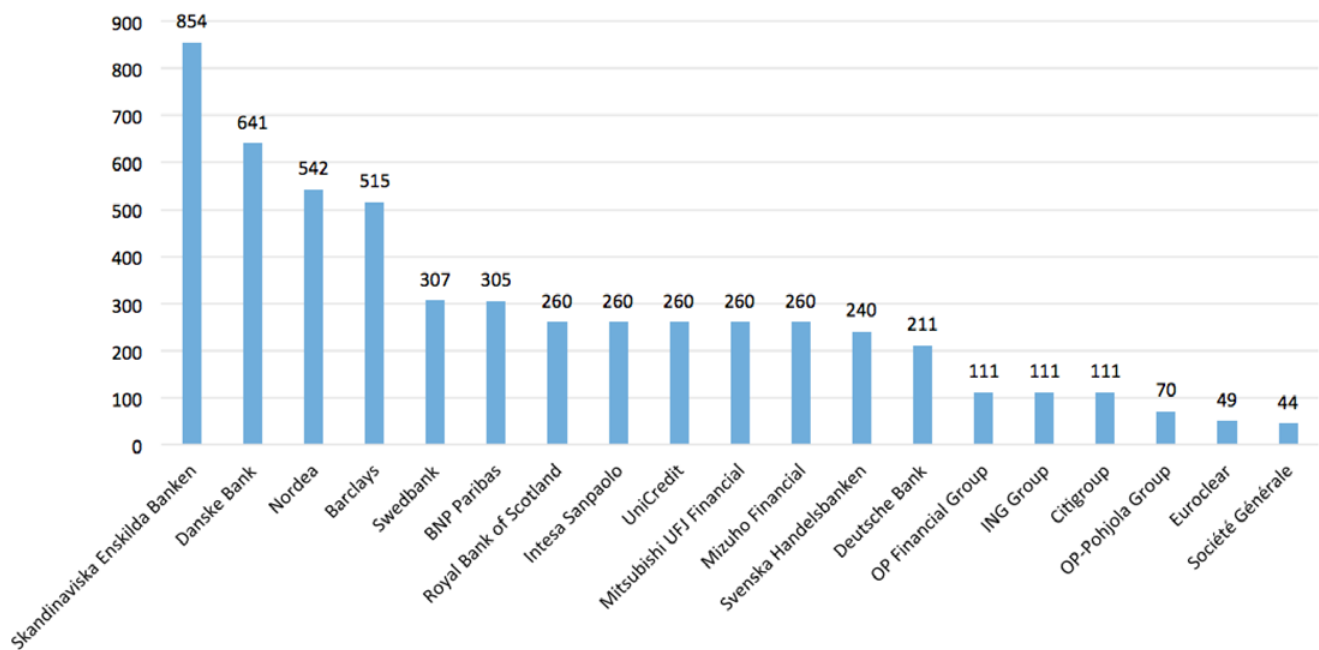
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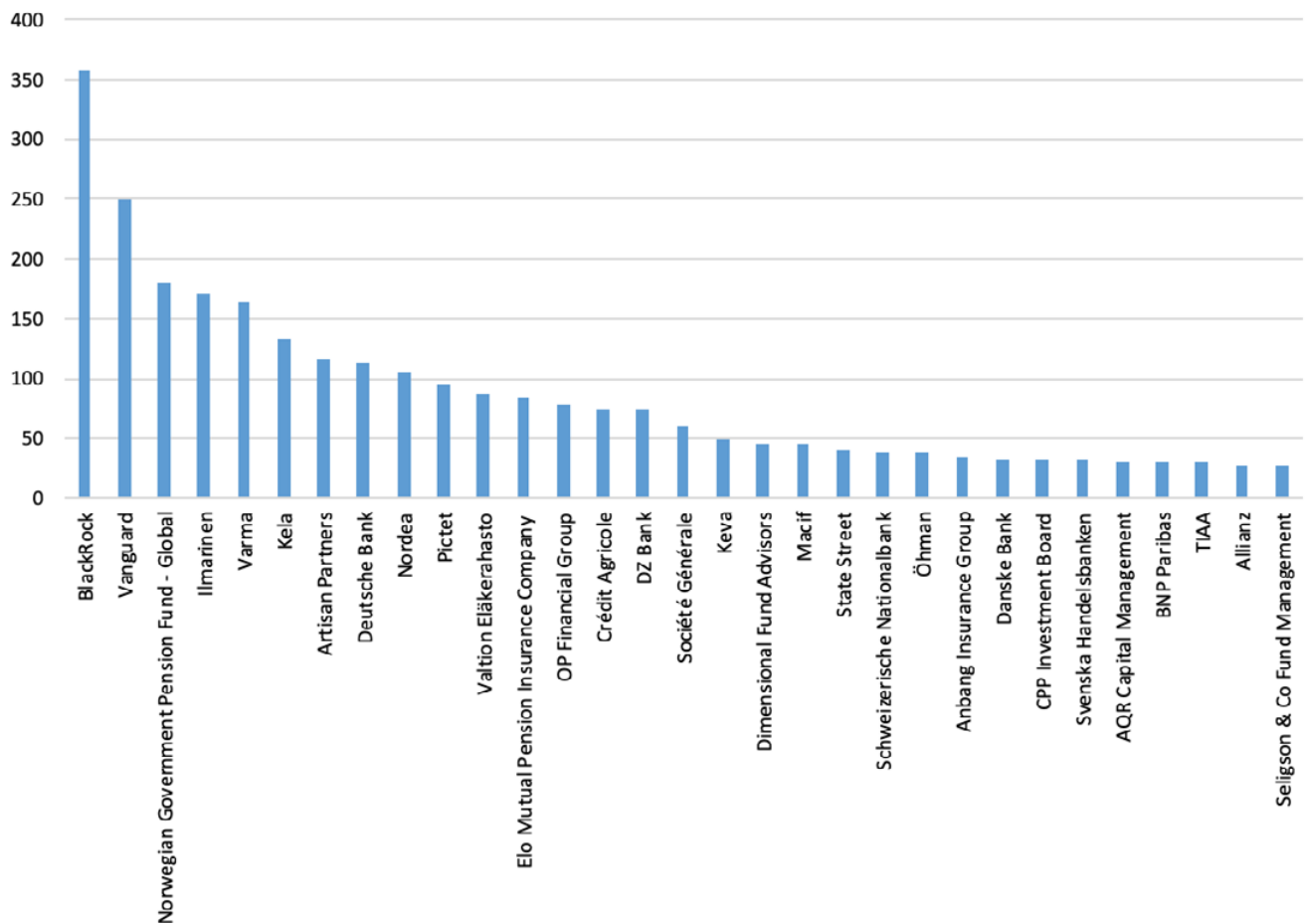
²⁰ Abschlussbericht: Kommission "Wachstum, Strukturwandel und Beschäftigung", January 2019 https://www.handelsblatt.com/downloads/23912864/3/190126_abschlussbericht_kommission-wachstum-strukturwandel-und-beschaeftigung_beschluss.pdf?ticket=ST-408630-ukON3XmWfR0126mz1ZFH-ap1

Annex 1 - Fortum's largest creditors and investors



Fortum's creditors 2016 - 2018, in millions EUR (loans and underwriting)

Source: Thomson EIKON (2019, February), Loans; Thomson EIKON (2019, February), *Share Issuances*; Thomson EIKON (2019, February), *Bond Issuances*; Bloomberg (2019, February), *Loan Search*; Bloomberg (2019, February), *Aggregated Debt*.



Fortum's investors top 30 (the Finnish state omitted), in millions EUR (bonds and shareholding)

Source: Thomson EIKON (2019, February), EMAXX; Thomson EIKON (2019, February), Shareholdings; Thomson EIKON (2019, February), Bond Issuances; Bloomberg (2019, February), Aggregated Debt.

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