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Healthcare Systems and Territorial Governments: The Essential Alliance to Advance Ecological Transition

The climate crisis strictly relates to global warming and the growing effects on people's health and environmental conditions. The evidence of the vulnerability of the European and especially the Mediterranean areas increases the need for more impacting actions. The EU project that involves 112 cities committed to reaching net zero impact by 2030 shows that such engaging commitment can be reached with a stricter alliance between territorial areas/cities and healthcare governments.

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key points

- Climate change refers to long-term shifts in temperatures and weather patterns. Energy, industry, transport, buildings, agriculture, and land use are among the main sectors that cause greenhouse gases.
- The consequences of climate change include intense droughts, water scarcity, severe fires, rising sea levels, flooding, melting polar ice, catastrophic storms and declining biodiversity.
- Net zero means cutting carbon emissions to an amount of residual emissions that can be absorbed and durably stored by nature and other carbon dioxide removal measures, leaving zero in the atmosphere.
- To avert the worst impacts of climate change and preserve a liveable planet, global temperature increase needs to be limited to 1.5°C above pre-industrial levels.
- The Earth is already about 1.2°C warmer than it was in the late 1800s, and emissions continue to rise. To keep global warming to no more than 1.5°C – as called for in the Paris Agreement – emissions need to be reduced by 45% by 2030 and reach net zero by 2050.
- The concept of a Green Hospital is based on providing healthcare without harming the environment or the healthcare worker or imposing restrictions on care.

Framework

The climate crisis resulting from global warming, the effects of which on people's health and well-being start to be more and more evident for all to see, is considered the most serious health threat of the 21st century. What is not completely realised is that we are talking about an actual threat, not something to envisage for a not-so-defined future. We are talking about the present, a dramatic phenomenon that fills the daily chronicles worldwide. This phenomenon affects everyone, progressively changing our lives and radically affecting the health and lives of new generations.

Very few persons or groups can deny that the GHGs produced by human activity made 2023 the hottest year in the last 100,000 years (Romanello et al. 2022).

Furthermore, scientists have alerted us that this record will not last long, as a new record can be expected in 2024.

Today, the earth's average global temperature has risen by about 1.2°C. If we do not change our ways of behaving, by the end of the century, it will rise to 2.7°C above pre-industrial levels. A value that may appear insignificant but is not both for creatures and even more for the environment in which they live. A temperature rise of just a few degrees could, in fact, irreversibly compromise some of the Earth's most sensitive ecosystems, such as coral reefs, tropical rainforests, permafrost and polar ice caps, with devastating consequences for the environment, fauna and the lives of many millions of people. By the end of the century, the 3°C rise in temperature would make many areas of the planet

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uninhabitable and force a third of the world's population to migrate for climatic reasons, exacerbating the social conflicts, frequently violent already, generated by the inescapable competition for access to sources of energy, water and food (Lenton et al. 2023).

Fast Action on Several Fronts Needed

In 2015, at the Covenant of Partners, known as CoP 21, 194 member states of the United Nations signed the famous Paris Climate Agreement in which governments around the world committed to keep global warming within 1.5°C. To this end, many intermediate targets have been defined and are constantly updated, including reducing man-made CO_2 emissions by 55% by 2030 and zero by 2050. These goals are certainly challenging but achievable, provided that action is taken in a synergetic, determined and rapid manner.

For each specific sector of activity (energy, agriculture, transport, urban environment, buildings, health, ...), there are many feasible and effective solutions with promising synergies and co-benefits, but everyone must play their part, including, of course, health professionals (AR6 Synthesis Report 2023). Indeed, since they deal with health problems, they should lead and set an example for everyone else. It must be admitted, however, that the sensitivity of health professionals on this issue, apart from a few praiseworthy exceptions, is still not

high enough, and certainly not because the provision of care does not have a significant impact on the environment. We have to remember that the healthcare system, between directly produced and induced emissions (the well-known Scope 1, 2 and 3), is responsible for about 4.6% of the total climate-altering gas emissions (Romanello et al. 2022). A significant figure, equal to almost double the entire world's air traffic, which, according to data from the International Council on Clean Transportation (ICCT), is about 2.4% of global CO_2 emissions come from air traffic.

This places direct healthcare and its related activities first among the various service sectors.

Promoting Collaboration and Co-Benefits Policy

The climate crisis is a complex, systemic problem that affects everyone and can only be successfully tackled through immediate, inter- and trans-disciplinary efforts to understand and propose action and coordinated activities by governments, local administrations, professionals, and citizens.
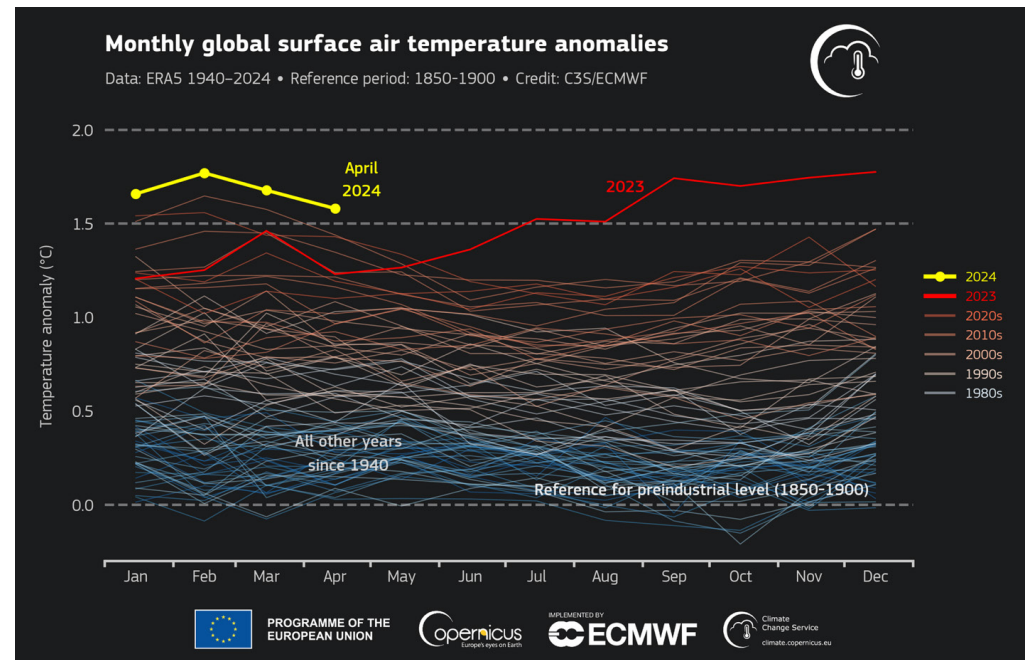
Monthly global surface air temperature anomalies (°C) relative to 1850–1900 from January 1940 to April 2024, plotted as time series for each year. 2024 is shown with a thick yellow line, 2023 with a thick red line, and all other years with thin lines shaded according to the decade, from blue (1940s) to brick red (2020s). Data source: ERA5. Credit: C3S/ECMWF

The climate crisis has no borders, and no one can hope to save themselves by acting alone.

Everyone must play their part in relation to their specific competencies and actual possibilities for action to maximise the benefits for the environment, economy and health. Many of the actions aimed at combatting the climate crisis, as well as safeguarding the planet from the deleterious effects of excessive warming, also have the important aspect of impacting positively on community and individual health, that we correctly have started to label the co-benefit strategy (Italian Ministry of Health 2022).

One of the many examples is creating cycle paths and walking trails, facilitating the understanding and habit of their use by citizens, which will make it possible to consume fewer fossil fuels and consequently improve the quality of urban air, reducing emissions of CO_2 and other air pollutants, with translates immediately in benefits on the incidence of respiratory diseases. At the same time, exercise facilitated by the possibility of walking or cycling in a safe environment helps reduce the incidence of many chronic diseases, including cardiovascular diseases. In other words, a virtuous circle is triggered with positive long-term effects on the environment and immediate effects on the individual and the urban environment in which they live.

Similarly, the actions implemented to reduce meat consumption in favour of proteins of vegetal origin, directly translate into cut on environmental impact, reduction of climate-altering gas emissions (producing 1 kg of beef generate a CO_2 emission equivalent to a car travelling 700 km, while the production of 1 kg of cereals is the equivalent of only 10 km of travel of the same car). In human health terms, a diet richer in vegetables and poorer in meat consumption contributes to reducing the incidence of obesity, diabetes, cardiovascular diseases and cancer.

In practice, the evidence and, therefore, the promotion of actions enhancing the co-benefits policy takes into account the interconnections between environment, health and human well-being and developing actions which seek to tackle climate change, not by taking from one part (environment) and giving to the other (humans), but by acting in an integrated and synergistic manner producing positive results for both (co-benefits) a real win-win situation.

This approach has to be explained, put into action, and appropriately disseminated with a clear exposition of its results. The visibility of the results makes it easier to convince people to take new initiatives (e.g., on urban mobility) or to change their behaviour (e.g., by increasing physical activity and changing their diet to a more vegetarian one). It is important to stress the immediate benefits for the single persons and the community in which they live. The improvement of the present, furthermore, has to be complemented with the anticipation of benefits that will be enjoyed by generations to come, which is, in effect, a further important bonus. As an old saying stresses "who doesn't have a present doesn't have a future".

Acting to Improve the Present for a Better Future: The Example of Bergamo in its Path for a Sustainable Future

Acting to improve the present in leu of a better future, it is certainly the attitude to adopt and disseminate. Words stimulate interest; examples give the determination to act". This is why it is important to give as much visibility to examples of actions that have adopted or are adopting this approach. One such example is that of the city of Bergamo. Presenting the case, it is important to stress that the area of the province of Bergamo, located in the region of Lombardy, North of Italy, was the first in which the COVID-19 epidemic made its identified appearance and then it became one of the most severely hit by the pandemic. That same area was suffering from pollutants such as PM 2.5, PM10 as, in general, it is all the Plain of the Po River. It is striking the coincidence between the geographic area suffering for a long time from heavy pollution and the zone seriously hit by the pandemic.

It is important to underline that the city of Bergamo, with a little over 120,000 inhabitants, was chosen by the European Commission, as announced on the 28 of April 2022, as one of 112 European cities (9 in Italy) participating in the Climate Neutral & Smart City Project. These cities, which are particularly sensitive to the issue of climate change, have committed to achieving climate neutrality by 2030, i.e. 20 years earlier than all the others. They will represent the model of reference for other Italian and European cities and commit themselves to putting environmental issues at the centre of local policies. To reach such an engaging goal, it is clear that they must involve institutions, entrepreneurs, professionals, shopkeepers, and intensively citizens They will have to launch concrete initiatives for ecological redevelopment and decarbonisation in all the various fields concerning urban health: energy efficiency of buildings, sustainable mobility, urban design, public green, soil consumption, waste management, food, etc.

In this context, on 6 April of this year, that is after about two years from the launching of the project, 41 public bodies, associations of citizens and

private companies signed the Climate City Contract: a document of intent, with which each signatory voluntarily committed to reduce CO_2 and CO_2eq emissions related to its own activities and monitor the results obtained. Achieving climate neutrality is now a collective goal that not only concerns the municipal administration but also requires the active commitment of citizens and all public and private social components.

The health sector is a highly engaged part of the movement in this direction. To this end, the Bergamo Medical Association, the Health Authorities of the province of Bergamo, the University, the renowned Mario Negri Research Institute and the Municipality of Bergamo have signed a detailed document of intent further specifying the path to follow "health services and ecological transition: an alliance between institutions" to share ideas, integrate knowledge and launching joint projects to reduce greenhouse gas emissions generated by health services. Based on this experience and generated by the initiative of the General Director of the Agency for the Protection of Heath in Italian ATS (Agenzia per la Tutela della Salute) of the neighbouring city of Brescia, together with the Brescia Medical Association, in recent days, a similar programme was launched in Brescia. This lays down the foundations for further effective collaboration between the two adjacent cities, increasing the impact potentiality of the EU programme.

Reducing the Carbon Footprint of Health Services

The large set of demanding goals in the framework of the EU programme has been defined in the Climate Change Contract. As mentioned above, it is clear that each sector has to confront the challenge of addressing this question: *What can we do more?* And the health sector can recognise that much needs to be done. A large body of scientific literature is available on the subject, but to move from words to actions, it is necessary, first and foremost, for the management of the companies to recognise the strategic value of the care initiative's sustainability and to create the operational conditions, but also the stimulating social context, where all are encouraged to do their best and each one feels the usefulness of even an individual action.

It is certainly important to pay attention that in the healthcare sector, the first prejudice to defeat is that you are required to make sacrifices for the patients to improve the environmental performance of the health systems, in other terms, you have to take away something from the patient to contribute to the environment. The patients themselves have sometime expressed such a concern. The best way to correct this wrong assertion is to get back to the above-mentioned evaluation of the co-benefits. Let's analyse the situation in any hospital, the major infrastructure of the healthcare system. It becomes
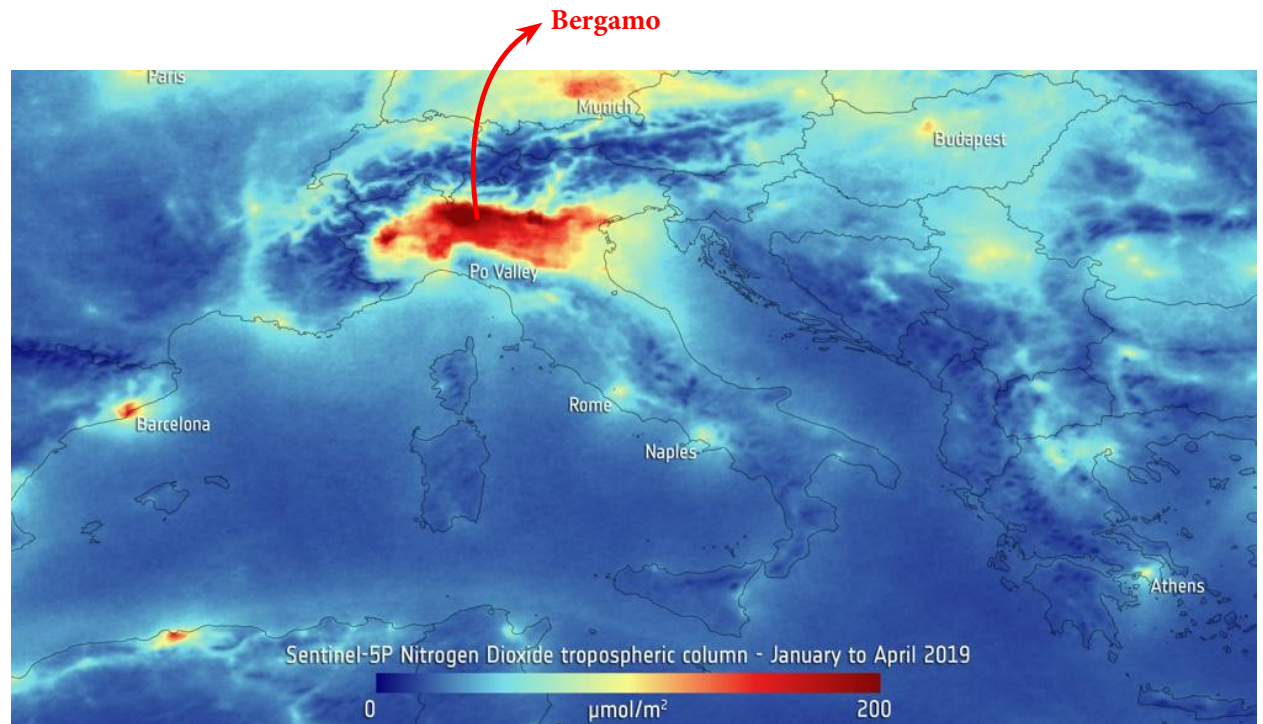
Bergamo: The pollution in the area of the River Po Valley in 2019 was almost coincident with the area of the first hit of the pandemic, progressively becoming the most hit. Source: European Space Agency

easily clear that the opposite is true: environmentally friendly actions, most of the time, produce an improvement in the quality of care. So much so that presently sustainability has been added to the classical dimensions through which the quality of healthcare activities is measured and evaluated, together with effectiveness, appropriateness, efficiency, equity, safety and perceived quality (Mortimer et al. 2018). This stresses once more that the environment is one of the main determinants of health. As the principles of "one health" penetrate every decision, it must be taken into account for each action, especially in the healthcare field. The possible effects on the natural ecosystems of which we are part, thinking of future generations is very important, but also, as stated before, it needs to be the basis of our present well-being.

Back to Bergamo, after signing the above-mentioned document of intent, the signatory institutions set up an inter-institutional "Green Team" that started to meet regularly and launched a number of important initiatives within the ten areas of work on which the participants are focusing. In the external circle, as interesting detail, the percentage of emissions attributed to each specific area of activity, is given and compared to the total emissions attributed to the health sector (NHS 2022):

1. **Energy supply and building management (10%):** Healthcare facilities consume enormous amounts of energy for heating, cooling and lighting. Energy supply and production, optimisation of consumption and energy efficiency in buildings, which have been at the centre of attention for years, with uneven results, are a good starting point for reaching an important step in the decarbonisation

of the sector in the comprehensive effort to tackle all the components involved, from the intervention of improvement of the building itself to the efficiency of the energy production including possible direct self-production of renewable energy.

2. **Transport and mobility (14%):** It includes different categories, and only cooperation among all the parts of society will allow us to achieve significant results. Let's consider the part where the hospitals can have direct or almost direct input: first the staff. Bonuses will be related to goals established by the sector to stimulate, for example, car sharing, substituting cars with bicycles, and facilitating pedestrian movements. The collaboration with the local government, which also has these goals in its participation in the EU project "Climate Neutral & Smart City, " will be essential for improving or designing public transport services. Active mobility (walking and cycling) must be promoted with protected pedestrian routes, cycle paths and parking facilities for scooters and bicycles. With regard to patients' movements, ambulances mainly, the goal is to cover it totally with electric vehicles. For the transport related to the arrival of medicines or to outsourced services (e.g. laundry or catering), the improvement will be achieved by making green transport a factor in the granting of tenders.

3. **Digitisation and telemedicine (5%):** Travel by patients and their carers can be considerably reduced through appropriate telemedicine initiatives, not least because of the benefits they bring from the patient, efficiency and cost perspectives.
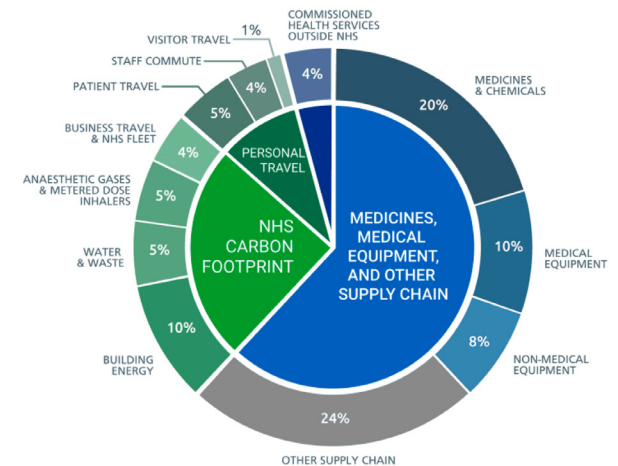
Delivering a 'Net Zero' National Health Service.
Source: NHS England 2022

4. **Medicines (20%):** The production, transport, use and disposal of medicines represent a major opportunity to reduce CO_2 eq emissions. An important action in the general healthcare sector is to stress the importance of appropriateness in prescriptions, choosing drugs with a lower environmental impact, e.g., powder inhalers for asthma, or opting for oral rather than intravenous administration of drugs.

5. **Anaesthetic gases (5%):** Of the various anaesthetic gases, desflurane is by far the most harmful to the environment, with a GWP (Global Warming Potential) index of approximately 2,500 times that of CO_2. Indeed, with a few exceptions, desflurane can be replaced with equally effective, safe and less environmentally harmful anaesthetic gases or by adopting alternative anaesthesia

techniques: intravenous or neuraxial (White et al. 2021).

6. **Healthcare waste (5%):** The impact of healthcare waste on the environment can be contained through initiatives aimed at reducing its quantity, limiting the use of disposable products and through measures favouring separate collection and recycling. A guide on how to use one-time plastic gloves has been experimented with good results. Bergamo's collaboration between the local government and the healthcare system will be based on the principle that producing waste is a complete process, that starts when selecting what is purchased, and circular economy principles must involve more than a single institution.

7. **Nutrition (6%):** Emissions from food can be reduced by adopting vegetarian diets, which are also healthier for humans. In addition, catering contracts can be reviewed, seasonal and local products can be promoted, waste can be recovered, etc. At this regard it must be better understood and used the role that hospitals can have "teaching to patients" to re-appreciate simple foods and ingredients displaced by the much more processed and complex diets now common in our cuisine.

8. **Contract measures and procurement (60%):** A large part of the emissions attributable to health services are generated during the production, transport, use and disposal of medical equipment, medical devices, drugs, food and consumables. Although the healthcare sector does not directly control these emissions, it is evident how important it is to pay attention to what is purchased, taking care to select companies and products that minimise risks to human health and the environment. Both PPI (Public Procurement of Innovation) and PCP (Pre-Commercial Procurement) are relatively new instruments that have to be better understood and used to direct the procurements processes .

9. **Appropriateness of diagnostic and treatment services:** Only 60% of treatment is based on guidelines of recognised effectiveness. 30% of prescribed treatments are considered useless or of little clinical value, and 10% are even labelled harmful (Braithwaite et al. 2020). Controlling over-prescriptions is considered one of the most important measures to contribute to limiting the climate footprint of health services and a valuable tool for reducing waste and improving the quality of care. The scientific literature is full of examples concerning the overuse of healthcare services, and on this issue, in recent years, several important international initiatives have been launched, among them the project 'Doing more does not mean doing better', also known as Choosing Wisely Italy.

10. **Training, information, and awareness-raising:** The key to building a resilient health system is to become aware that the climate emergency is a serious threat to human and planetary health and that we must act quickly. Changing habitual behaviour requires that people know what they have to do, are able to do it and have the opportunity to do it. To this end, health institutions must know that as part of their role, their core business and strategic interest is the sustainability of health services, informing practitioners of the steps to be taken, and removing obstacles so that everyone is enabled to do their best.

A Creative Initiative for GPs, Easy to Reproduce

The Bergamo Medical Association, in its innovative newsletter on the environment and climate crisis, sent monthly to all doctors in the province of Bergamo, has introduced a section called "Green Pills" with practical suggestions for implementing individual and collective actions to reduce environmental impact without compromising the quality of care.

The group is currently engaged in defining a common working tool (Green Hospital Toolkit) which aims to;

- Help healthcare organisations and professionals identify the initiatives they can implement to reduce the carbon footprint of their activities.

- Inform and describe the actions taken in the different areas of work, taking into account the specific local operating context.

- Establish the starting point and periodically measure the results achieved through a list of shared indicators that will be provided.

Conclusion

Reducing the ecological footprint of health services is possible, but this doesn't mean it is easy. Awareness of the problem needs to be raised, and the entire sector, including the supply chain, needs to be involved. Many habits and routine behaviours, not questioned on their appropriateness, need to be changed, and new unmet needs must emerge. Data have to be used better; more data must be collected and exchanged among bodies within the health sector and inter-sector. Staff need to

be trained. More funds must be granted. But above all, it is a cultural problem. Many of the decarbonisation initiatives also contribute to lower service costs. The real problem is realising that our health is influenced to a large extent by the interaction between man and nature, that preserving the environment is also our ethical and professional responsibility, and that change is possible without compromising, possibly enhancing, the quality and safety of care.

Acknowledgement

Conflict of Interest

None.

references

Braithwaite J, Glasziou P, Westbrook J (2020) The three numbers you need to know about healthcare: the 60-30-10 Challenge. BMC Med. 18:102.

ICCP 2023. AR6 Synthesis Report: Climate Change 2023.

Lenton TM, Xu C, Abrams JF et al. (2023) Quantifying the human cost of global warming. Nat Sustain. 6:1237–1247.

Ministero della Salute - Consiglio Superiore di Sanità (2022) The policy of the health co-benefits in the mitigation of climate change (Politica dei co-benefici sanitari della mitigazione del cambiamento climatico).

Mortimer F, Isherwood J, Wilkinson A, Vaux E (2018) Sustainability in quality improvement: redefining value. Future Healthc J. 5(2):88-93.

NHS (2022) Delivering a "Net Zero" National Health Service.

Romanello M, Di Napoli C, Drummond P et al. (2022) The 2022 report of the Lancet Countdown on health and climate change: health at the mercy of fossil fuels. Lancet.;400(10363):1619-1654.

White SM, Shelton CL, Gelb AW et al. (2022) Principles of environmentally sustainable anaesthesia: a global consensus statement from the World Federation of Societies of Anaesthesiologists. Anaesthesia. 77(2):201-212.