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SDG 7: Affordable and Clean Energy in Oral Healthcare

There is an increased global demand for energy driven by population growth and increased technology dependence, which at the same time is causing anthropogenic climate change. Both can be managed by ensuring access to affordable and clean energy, that is key to achieve global energy security¹.

This article considers the Sustainable Development Goal 7 (SDG7) in the context of oral healthcare and how we can engage to mitigate climate change and contribute to planetary health. The aim of SDG7 is to “Ensure access to affordable, reliable, sustainable and modern energy for all” with specific targets to be achieved by 2030 (Table 1)².

As individuals, tucked away in our surgeries and quietly getting on with our jobs, we may assume that any progress towards implementation of the UN Sustainable Development Goals is safely in the hands of governments. The reality is that currently, the world is not on track to meet the SDGs by the target date of 2030. Governments are failing to make sustained progress or translating the goals into concrete policy changes³.

The UN is re-invigorating the SDG targets highlighting that synergistic work between the SDGs and climate action results in environmental and socioeconomic co-benefits⁴. A perfect example of this win-win situation is that the provision of good quality oral healthcare, will benefit the individual, society and the profession with direct environmental sustainability gains from reduced CO₂e emissions and reduced waste⁵.

In parallel with the SDG efforts, the energy sector has developed an ‘Energy hierarchy’ with a similar structure to the well-established ‘Waste hierarchy’ strategy^{6,7} (Figure 1). Both hierarchical strategies have proven to be very influential in advancing ways to control waste and energy and they provide a further framework for our efforts in oral healthcare.

UN SDG7 – Targets for 2030:	
Target 1	Ensure universal access to affordable, reliable and modern energy services.
Target 2	Increase substantially the share of renewable energy in the global energy mix.
Target 3	Double the global rate of improvement in energy efficiency.
Target 4	Enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology
Target 5	Expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing states, and land-locked developing countries, in accordance with their respective programmes of support

Table 1: United Nations Sustainable Goal 7 – Targets to be reached by 2030.

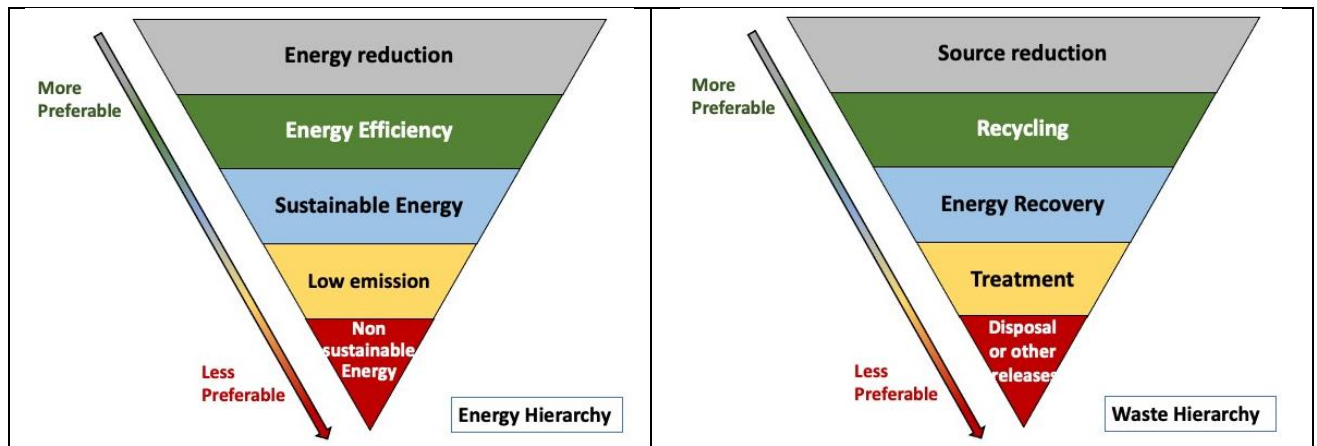


Fig 1: **Left** - Energy Hierarchy, proposed by Philip Wolfe in 2005 and subsequently refined and adopted by the energy industry and government.⁶ **Right** – Waste Hierarchy, proposed by Hyman et al (2013) in the UNEP and widely adopted as a fundamental strategy.⁶ Figures adapted by Nicolas Martin, 2023.

Energy Hierarchy applied to Oral Healthcare

Energy reduction

Reduction of energy use at all levels is the most preferable strategy with the most impactful outcomes. The focus is energy conservation and not wasting energy. We know that the greatest contribution to CO₂e emissions in dentistry arises from patient journey and staff commute⁸. Our efforts should concentrate in reducing the use of combustion engine cars for these journeys. The single most effective way to achieve this, is by reducing the need for patients to attend for the treatment of preventable oral diseases^{5,9}. This has a synergistic impact with the waste reduction hierarchy, that results in a reduction of energy use and unnecessary waste from all sectors in the supply chain, not just the dental practice. Remote clinical consultations may provide a further strategy to reduce patient commute^{10,11}. In addition, practical measures that encourage the use of electric vehicles with charging stations in the carpark of the dental practice should be considered. Improved insulation of the dental practice and switching off lights and appliances when not in use, such as lunch breaks, are effective strategies. It is helpful to remember that these small measures, when multiplied by the thousands of dental practices around the world, equate to many thousands of saved megawatts of energy.

Energy efficiency

The energy efficiency of equipment and infrastructure is the balance between the productivity of the device and the energy it consumes. LED lighting is a great example of how to tip the balance in favour of efficiency versus consumption. The purchase of energy efficient equipment should be a strong consideration. For example, the use of 'A' labelled energy efficient refrigerators in Europe, will result in a reduction of up to 9.6 TWh of electricity per year by 2030 and will prevent around 3.1 million tonnes of CO₂ from being emitted every year; which is close to the annual household electricity consumption of Lithuania¹².

Sustainable energy

The most achievable form of sustainable energy is to purchase this from the national grid if it uses elemental renewables, such as sunlight, wind, waves, tides or rainfall. At a local level,

dental practices can install solar panels to generate electricity and heat pumps (geothermal energy), set to become the most economical and the lowest carbon form of heating available¹³.

Low emission and non-sustainable energy

These two strategy categories, that are considered the least preferable, focus on the use of fossil fuels with carbon capture and storage and unabated fossil fuels. Neither of these are within the direct domain of oral healthcare provision but, we can, as a profession apply pressure and lobby our governments to stop using these highly undesirable energy forms.

Conclusion

In oral healthcare, the most impactful way to achieve the aim of SDG7 is through the provision of good oral healthcare, that reduces the need for treatment and re-treatment of preventable diseases and the associated patient commute and energy use throughout the supply chain. We should also engage with energy efficiency measures in our dental practices. We should be mindful that our apparently small individual efforts are hugely impactful when multiplied by the thousands of dental practices around the world.

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